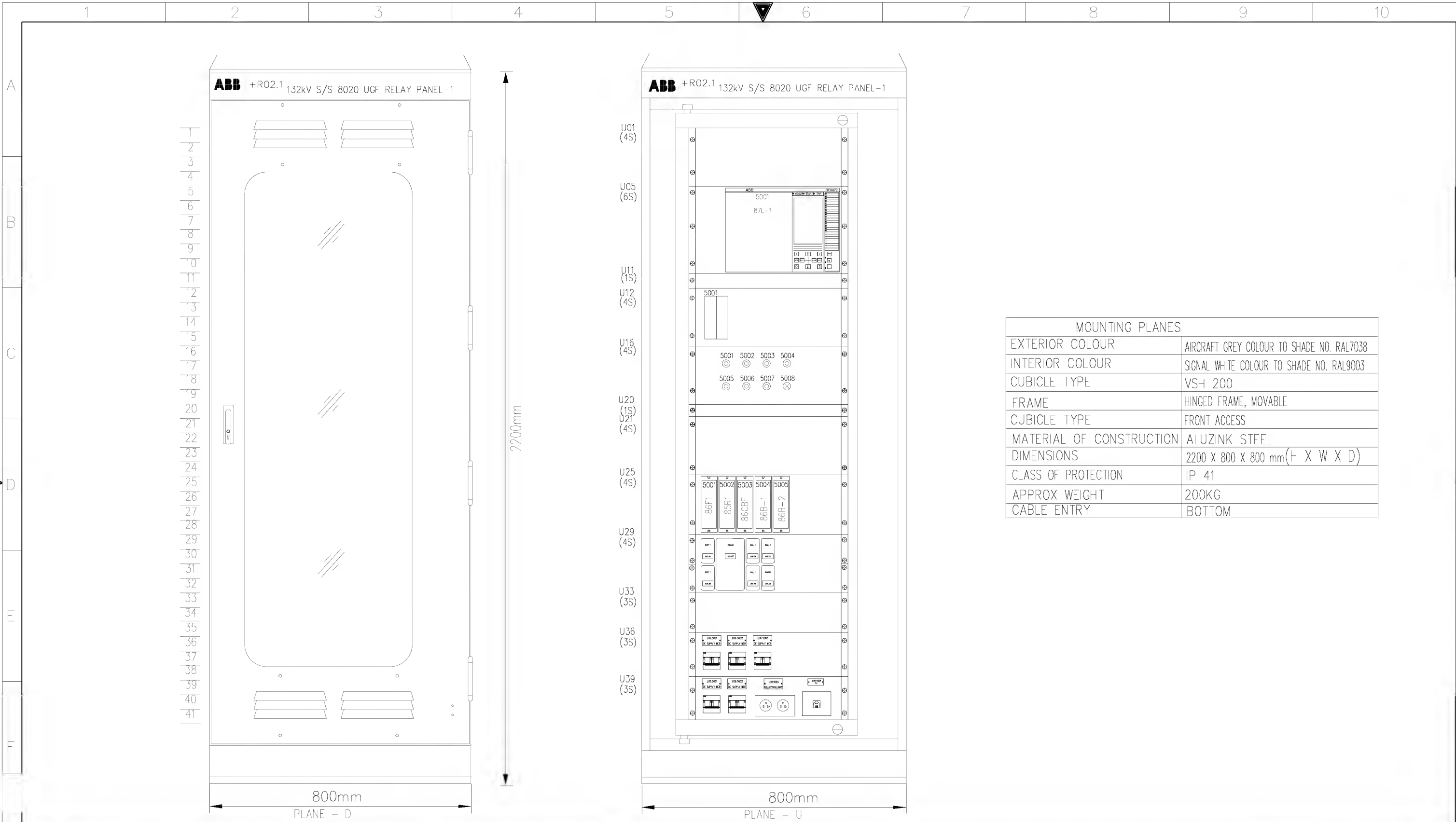


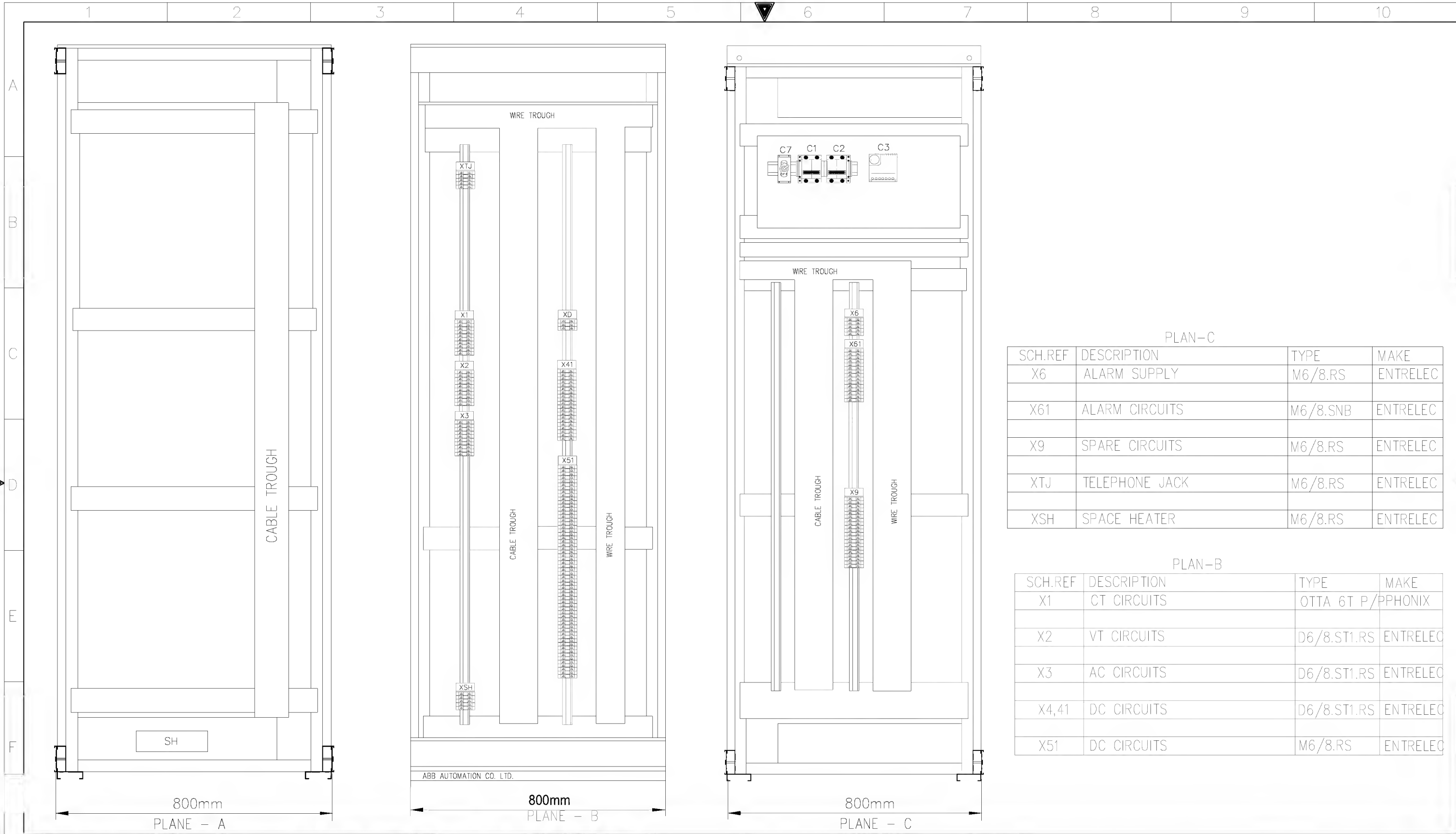
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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| A | <div><div>ABB</div><div>POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656</div></div> | | | | | | |
| B | | | | | | | |
| C | CONTRACTOR : ABB Contracting Company | | | | | | |
| D | CLIENT : National GridSA | | | | | | |
| E | PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8 | | | | | | |
| F | SUBSTATION : S/S 8709 | | | | | | |
| | CONTRACT NO. : 11131113/00 | | | | | | |
| | TITLE : Assembly Drawing – +R02.1 [Under Gr | | | | | | |

| | | | | | | |
|---|------------------------------|-------|--------------------------|--|--------------------------------------|--|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 | COVER SHEET | |
| | 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ CHECKED BY KVR | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | |
| | 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 DATE COMPLETED _____ | S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | RIYADH SAUDI ARABIA | |



| MOUNTING PLANES | |
|--------------------------|---|
| EXTERIOR COLOUR | AIRCRAFT GREY COLOUR TO SHADE NO. RAL7038 |
| INTERIOR COLOUR | SIGNAL WHITE COLOUR TO SHADE NO. RAL9003 |
| CUBICLE TYPE | VSH 200 |
| FRAME | HINGED FRAME, MOVABLE |
| CUBICLE TYPE | FRONT ACCESS |
| MATERIAL OF CONSTRUCTION | ALUZINK STEEL |
| DIMENSIONS | 2200 X 800 X 800 mm (H X W X D) |
| CLASS OF PROTECTION | IP 41 |
| APPROX WEIGHT | 200KG |
| CABLE ENTRY | BOTTOM |

| | | | | | | | | | | | | |
|------------------------------|--|--|-------------------------------------|--|--------------------------------------|--|-------------------------------------|--|------------------------------|--|--------------|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | ASSEMBLY DRAWING | | الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | |
| DRAWN BY RIZ CHECKED BY KVR | | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | SHT | | CONT. | |
| DATE STARTED 24.01.2013 | | | DATE COMPLETED _____ | | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | | RIYADH | | SAUDI ARABIA | |
| FOR APPROVAL | | | INDEX | | PLANT NO. | | DRAWING NUMBER | | SHEET NO. | | REV. NO. | |
| REV. NO. | | | - | | C421 | | CD-322914 | | G01 | | G02 | |
| DESCRIPTION | | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | RIYADH | | SAUDI ARABIA | | 01 | |



PLAN-C

| SCH.REF | DESCRIPTION | TYPE | MAKE |
|---------|----------------|----------|----------|
| X6 | ALARM SUPPLY | M6/8.RS | ENTRELEC |
| X61 | ALARM CIRCUITS | M6/8.SNB | ENTRELEC |
| X9 | SPARE CIRCUITS | M6/8.RS | ENTRELEC |
| XTJ | TELEPHONE JACK | M6/8.RS | ENTRELEC |
| XSH | SPACE HEATER | M6/8.RS | ENTRELEC |

PLAN-B

| SCH.REF | DESCRIPTION | TYPE | MAKE |
|---------|-------------|-------------|----------|
| X1 | CT CIRCUITS | OTTA 6T P/ | PPHONIX |
| X2 | VT CIRCUITS | D6/8.ST1.RS | ENTRELEC |
| X3 | AC CIRCUITS | D6/8.ST1.RS | ENTRELEC |
| X4,41 | DC CIRCUITS | D6/8.ST1.RS | ENTRELEC |
| X51 | DC CIRCUITS | M6/8.RS | ENTRELEC |

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | | |
|----------|-------|-----------------|--|
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 DATE COMPLETED _____ |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC |

ASSEMBLY DRAWING

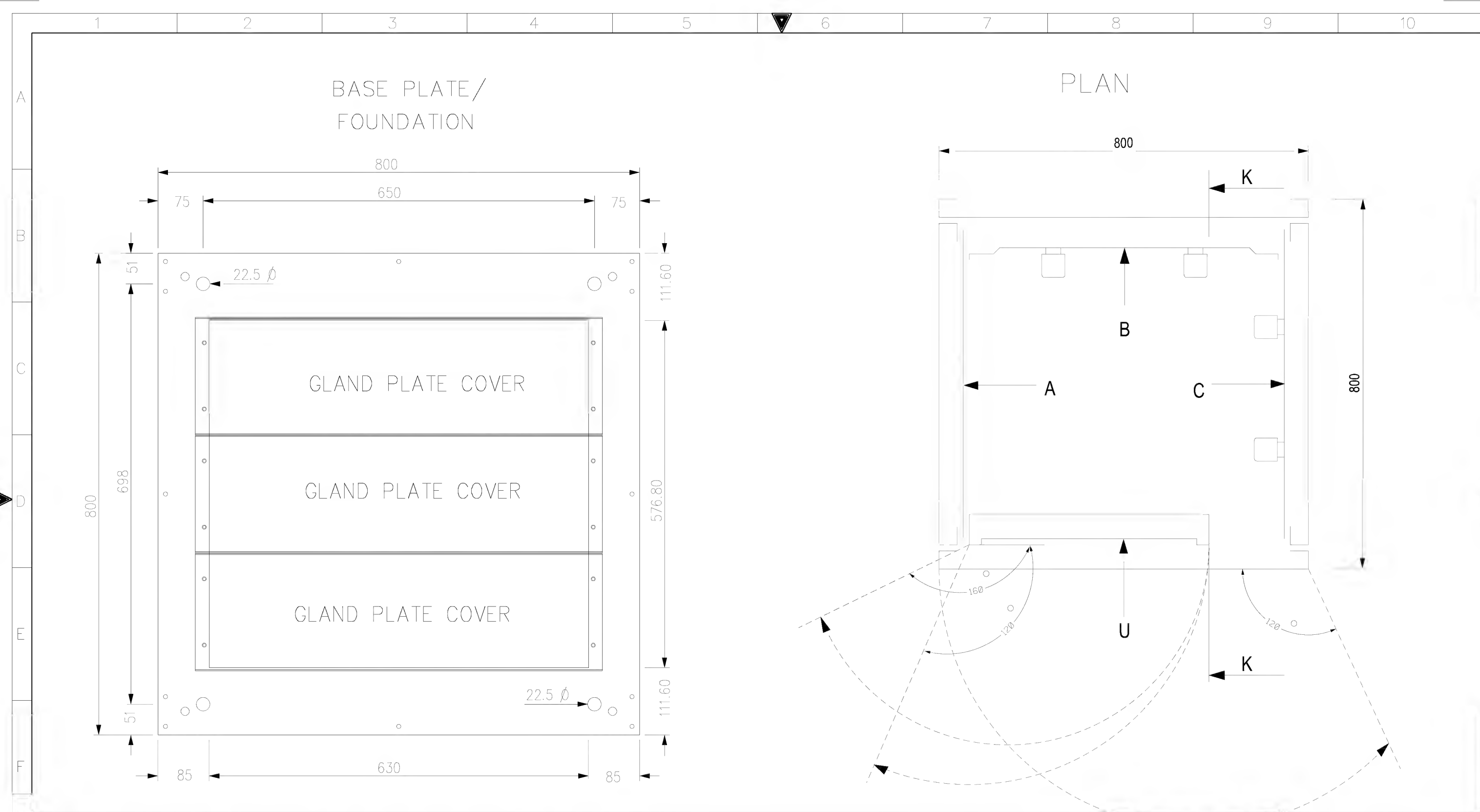
132kV UGF-8020 RELAY PANEL-1 +R02.1
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
National Grid sa

| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
|-------|-----------|----------------|-----------|----------|
| - | C421 | CD-322914 | SHT CONT. | 01 |
| | | | G02 G03 | |

NG/D2-D (2012/01)

DMS VECTOR NGD200



AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | |
|----------|-------|-----------------|
| 01 | 13 49 | FACTORY ASBUILT |
| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

DRAWN BY RIZ CHECKED BY KVR
DATE STARTED 24.01.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

ASSEMBLY DRAWING
132kV UGF-8020 RELAY PANEL-1 +R02.1
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

| | | | | |
|--|-----------|----------------|-----------|----------|
| الشركة الوطنية لنقل الكهرباء National Grid sa | | | | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| - | C421 | CD-322914 | G03 G04 | 01 |

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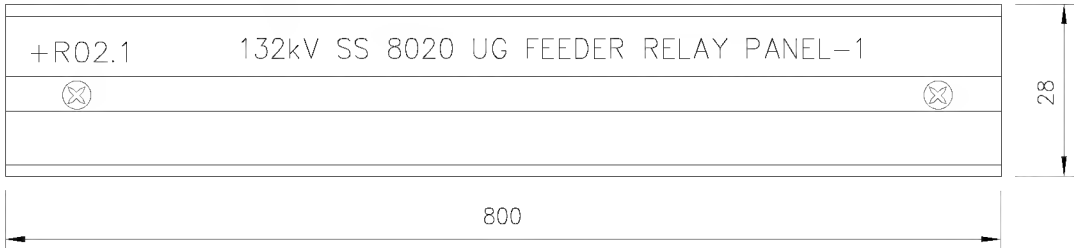
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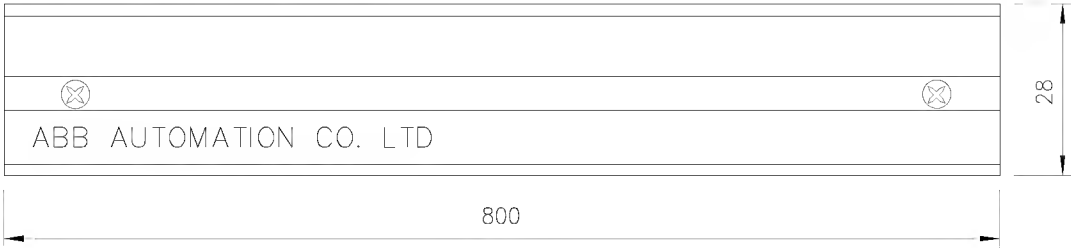


TOP VIEW FOR EARTHING BAR

U PLANE TOP LABEL



U PLANE BOTTOM LABEL



MANUFACTURING LABEL

ABB
ABB Automation Co.Ltd.

PROJECT : National Grid SA
S/S 8709

ORDER REFERENCE : 2875 RF S13656


YEAR OF MANUFACTURE: 2013


PANEL NO. : +R02.1

DRAWING NO. : S13656-CD-323916

MADE IN THE KINGDOM OF SAUDI ARABIA

G

| | | | | | | | | | | | | | | | | |
|------------------------------|-------|-----------------|------------------------------|--|---------------------------------|--|--------------------------------------|--|--|---|-----------|----------------|--|-----------|-------|----------|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | ASSEMBLY DRAWING | | | <div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء National Grid sa</div> | | | | | | |
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY _____ RIZ _____ | | CHECKED BY _____ KVR _____ | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | - | C421 | CD-322914 | | SHT | CONT. | 01 |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. _____ CTPD _____ | | ENG. DEPT. _____ AUT-PSAC _____ | | RIYADH SAUDI ARABIA | | | | | | | G04 | L00 | |
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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A |  | | POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656 | | | | | ABB AUTOMATION COMPANY LTD., 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A | | |
| B | | | | | | | | | | |
| C | CONTRACTOR : ABB Contracting Company | | | | | | | | | |
| | CLIENT : National Gridsa | | | | | | | | | |
| D | PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY | | | | | | | | | |
| | SUBSTATION : S/S 8709 | | | | | | | | | |
| E | CONTRACT NO. : 11131113/00 | | | | | | | | | |
| F | TITLE : LIST OF APPARATUS +R02.1 [Under Ground Feeder] | | | | | | | | | |

| | | | | | | | | | | | |
|---|------------------------------|-------|--------------------------|-------------------------|---------------------|--------------------------------------|---|-----------|----------------|-----------|-----------|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 | COVER SHEET | |  نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| | 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED | S/S 8709-132/13.8KV IN AL-KHARJ CITY | - | C421 | CD-322914 | SHT L00 | CONT. L01 |
| | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC | RIYADH SAUDI ARABIA | | | | | 01 |

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| SR. NO. | GA. REF. | SCH. REF. | D E S C R I P T I O N | SHT. | QTY. | TYPE | MAKE | ORDERING INFORMATION | COUNTRY OF ORIGIN |
|---------|----------|-----------|---|------|------|-----------|------|----------------------|-------------------|
| | | | RELAY CUBICLE- +R03.1 ACCOMODATING THE FOLLOWING | | 1 | VSH 200 | ABB | | |
| 1 | U05.5001 | 87L-1 | NUMERICAL DIFF PROTECTION TERMINAL WITH THE FOLLOWING | 298 | 1 | RED 670 | ABB | 1MRK 004 810-DC | SWEDEN |
| | | | FEATURES : | 298A | | | | | |
| | | | ANALOG MODULE(6I+6U) | 299 | | | | | |
| | | | RATED POWER SUPPLY MODULE : (90-250V)DC | | | | | | |
| | | | BINARY I/P MODULE -1NO | | | | | | |
| | | | BINARY O/P MODULE-1NO | | | | | | |
| | | | OPTICAL ETHERNET MODULE IEC 61850-8-1/100 BASE FX CHANNEL GLASS | | | | | | |
| | | | MEDIUM GRAPHIC HMI,15 CONTROLLABLE OBJECTS,1X 19" | | | | | | |
| 2 | U12.5001 | TS-1 | TEST SWITCH FOR RED 670 RELAY | 224 | 1 | RTXP24 | ABB | RK 926 315-AC | |
| | | | | | | | | | |
| 3 | U16.5001 | S86F1 | PUSH BUTTON FOR 86CBF & 86F1 TRIP RELAY RESET PB | 232 | 2 | MP1-10B | ABB | 1SFA 611 100 R1006 | SWEDEN |
| | U16.5002 | S86CBF | BUTTON COLOUR : BLACK | | | MCBH-20 | | 1SFA 611 605 R1102 | |
| | | | CONTACT DATA : 1NO+1NC | | | | | | |
| 4 | U16.5003 | S86B-1 | PUSH BUTTON FOR 86B & LT TRIP RELAY RESET PB | 232 | 3 | MP1-10B | ABB | 1SFA 611 100 R1006 | SWEDEN |
| | U16.5004 | S86B-2 | BUTTON COLOUR : BLACK | | | MCBH-20 | | 1SFA 611 605 R1102 | |
| | U16.5005 | LT | CONTACT DATA : 1NO+1NC | | | | | | |
| 5 | U16.5006 | S01 | PUSH BUTTON FOR PROTECTION IN | 232 | 1 | MP1-10B | ABB | 1SFA 611 100 R1006 | SWEDEN |
| | | | BUTTON COLOUR : BLACK | | | MCBH-20 | | 1SFA 611 605 R1102 | |
| | | | CONTACT DATA : 1NO+1NC | | | | | | |
| 6 | U16.5007 | S02 | PUSH BUTTON FOR PROTECTION OUT | 232 | 1 | MP1-10B | ABB | 1SFA 611 100 R1006 | SWEDEN |
| | | | BUTTON COLOUR : BLACK | | | MCBH-20 | | 1SFA 611 605 R1102 | |
| | | | CONTACT DATA : 1NO+1NC | | | | | | |
| 7 | U16.5008 | L01 | INDICATION LAMP FOR FPFM OUT | 277 | 1 | MC1-10010 | ABB | 1SFA 611 400 R1003 | |
| | | | LENS : WHITE | | | MCBH-003 | | 1SFA 611 605 R1400 | SWEDEN |
| | | | LED RATING : 110-130V,4-6MA | | | KA2-2145 | | 1SFA 616 921 R2145 | |
| | | | HOLDER RATING : 130V WITH RESISTORS DIODEBLOCK | | | | | | |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| A | SR. NO. | GA. REF. | SCH. REF. | D E S C R I P T I O N | SHT. | QTY. | TYPE | MAKE | ORDERING INFORMATION | COUNTRY OF ORIGIN | |
| | 8 | U25.5001 | 86F1 | HIGH BURDEN TYPE HAND/ELECTRICAL RESET TRIP RELAY AUXILIARY VOLTAGE : 110 - 125V DC OUTPUT CONTACTS : 8NO+2NC OPERATION INDICATOR : HAND RESET FLAG | 232 | 1 | MVAJ105 | ALSTOM | MVAJ105RA0802A | UK | |
| | 9 | U25.5002 | 85R1 | HIGH BURDEN TYPE SELF RESET TRIP RELAY AUXILIARY VOLTAGE : 110 - 125V DC OUTPUT CONTACTS : 10 NO OPERATION INDICATOR : SELF RESET FLAG | 233 | 1 | MVAJ101 | ALSTOM | MVAJ101RA0800A | UK | |
| | 10 | U25.5003 | 86CBF | HIGH BURDEN TYPE HAND/ELECTRICAL RESET TRIP RELAY AUXILIARY VOLTAGE : 110 - 125V DC OUTPUT CONTACTS : 8NO+2NC OPERATION INDICATOR : HAND RESET FLAG | 276 | 1 | MVAJ105 | ALSTOM | MVAJ105RA0802A | UK | |
| B | 11 | U25.5004 | 86B-1 | HIGH BURDEN TYPE HAND/ELECTRICAL RESET TRIP RELAY AUXILIARY VOLTAGE : 110 - 125V DC OUTPUT CONTACTS : 8NO+2NC OPERATION INDICATOR : HAND RESET FLAG | 276 | 1 | MVAJ105 | ALSTOM | MVAJ105RA0802A | UK | |
| | 12 | U25.5005 | 86B-2 | HIGH BURDEN TYPE HAND/ELECTRICAL RESET TRIP RELAY AUXILIARY VOLTAGE : 110 - 125V DC OUTPUT CONTACTS : 8NO+2NC OPERATION INDICATOR : HAND RESET FLAG | 277 | 1 | MVAJ105 | ALSTOM | MVAJ105RA0802A | UK | |
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| G | AS-BUILT BY | DATE | CONTRACT NO. | 11131113/00 | JOB ORDER NO. | S-13656 | LIST OF APPARATUS | | | | |
| | 13 49 | | DRAWN BY | RIZ | CHECKED BY | KVR | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | | |
| | 00 | 13 04 | FOR APPROVAL | DATE STARTED | 24.01.2013 | DATE COMPLETED | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | |
| | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. | CTPC | ENG. DEPT. | AUT-PSAC | RIYADH SAUDI ARABIA | | | |
| | | | | | | | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| | | | | | | | - | C421 | CD-322914 | L02 | L03 01 |

NG/D2-D (2012/01)

DMS VECTOR NGD200

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| 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | 10 | | | |
| A | SR. NO. | GA. REF. | SCH. REF. | D E S C R I P T I O N | | | | SHT. | QTY. | TYPE | MAKE | ORDERING INFORMATION | | | | COUNTRY OF ORIGIN | | | | | |
| | 13 | U29.101 | 74R1/74IT1 | DUAL COIL RELAY FOR R1 DC /74IT1 DC | | | | 232,233 | 2 | RXSF 1 | ABB | RK 271 019-AN | | | | SWEDEN | | | | | |
| | | U29.301 | 74RS/74IS | AUXILIARY VOLTAGE : 110-125VDC | | | | 277 | | | | | | | | | | | | | |
| B | | | | CONTACT DATA : 1NO + 2NC PER COIL | | | | | | | | | | | | | | | | | |
| | 14 | U29.107 | K01M | BISTABLE RELAY | | | | 232 | 1 | RXMVB 4 | ABB | RK 251 401-AP | | | | SWEDEN | | | | | |
| | | | | AUXILIARY VOLTAGE : 125V DC | | | | | | | | | | | | | | | | | |
| C | | | | CONTACT DATA : 7NC+7NO | | | | | | | | | | | | | | | | | |
| | 15 | U29.119 | TMR/86F1 | DELAY FOR PICKUP RELAY | | | | 232 | 3 | RXKL1 | ABB | 1MR 000 066-AB | | | | SWEDEN | | | | | |
| | | U29.319 | TMR/86B-1 | AUXILIARY VOLTAGE : 24-250V DC | | | | 276 | | | | | | | | | | | | | |
| D | | U29.125 | TMR/86B-2 | CONTACT DATA : 2C/0 | | | | 277 | | | | | | | | | | | | | |
| | 16 | U29.325 | R1 | RESISTOR UNIT FOR TCS | | | | 291 | 1 | RXTMA1 | ABB | RK 711 008-AF | | | | SWEDEN | | | | | |
| | | | | RESISTOR WATT : 6.8 K OHMS | | | | | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | | | | | | | | | |
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| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | LIST OF APPARATUS | | | | الشركة الوطنية لنقل الكهرباء | | | | نقل الكهرباء | | | | | | | |
| 01 13 49 | | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | | INDEX | | | | PLANT NO. | | DRAWING NUMBER | | SHEET NO. | | REV. NO. | |
| 00 13 04 | | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | - | | | | C421 | | CD-322914 | | L03 L04 | | 01 | |
| REV. NO. | | DATE | | DESCRIPTION | | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | | SAUDI ARABIA | | | | | | | | | | | |
| NG/D2-D (2012/01) | | | | | | | | | | | | | | | | | | | | | |
| DMS VECTOR NGD200 | | | | | | | | | | | | | | | | | | | | | |


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|---|---|---|---|---|---|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A | | | | | | | | | |
| B | | | | | | | | | |
| C | | | | | | | | | |
| D | | | | | | | | | |
| E | | | | | | | | | |
| F | | | | | | | | | |


| LABEL REF. | LABEL ENGRAVING | MATERIALS | ENGRAVING | LABEL SIZE | LETTER SIZE |
|------------|--------------------------|-----------|--------------------------------------|------------|-------------|
| C1 | C1 127V AC SUPPLY MCB | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| C2 | C2 220V AC SUPPLY MCB | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| C3 | C3 THERMOSTAT | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| C7 | C7 ON/OFF SWITCH | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| DS | DS DOOR SWITCH | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| IL | IL ILLUMINATION LAMP | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| SH | SH SPACE HEATER | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5001 | U39.5001 Q1 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5002 | U39.5002 Q2 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5003 | U39.5003 C01/C02 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5004 | U39.5004 TJ | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U36.5001 | U36.5001 Q3 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U36.5002 | U39.5002 Q4 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U36.5003 | U36.5003 Q5 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |

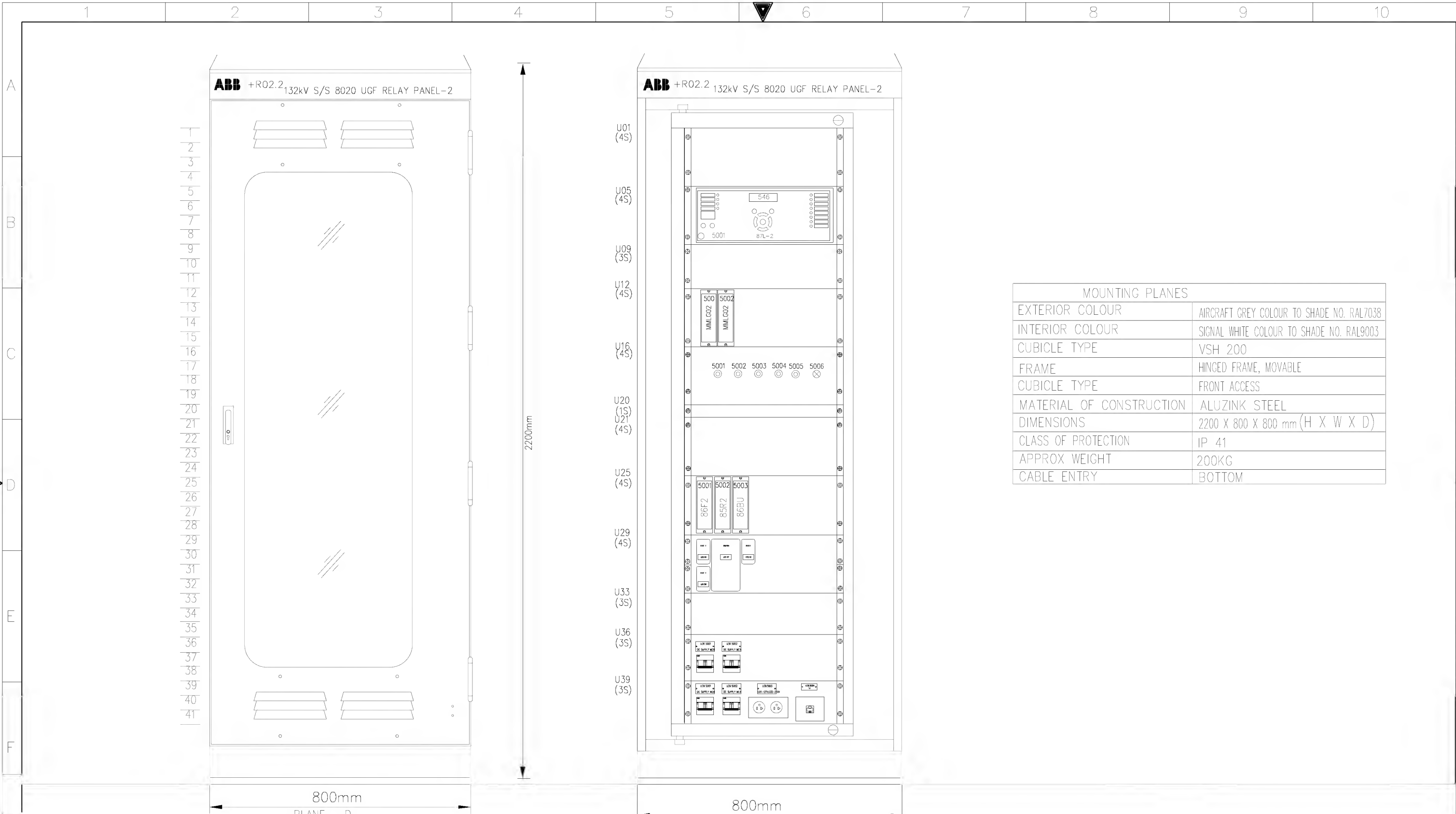
| | | | |
|------------------------------|-------|--------------------------|--|
| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 |
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 DATE COMPLETED _____ |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC |


| | |
|--------------------------------------|--------------|
| LIST OF APPARATUS | |
| 132kV UGF-8020 RELAY PANEL-1 +R02.1 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH | SAUDI ARABIA |

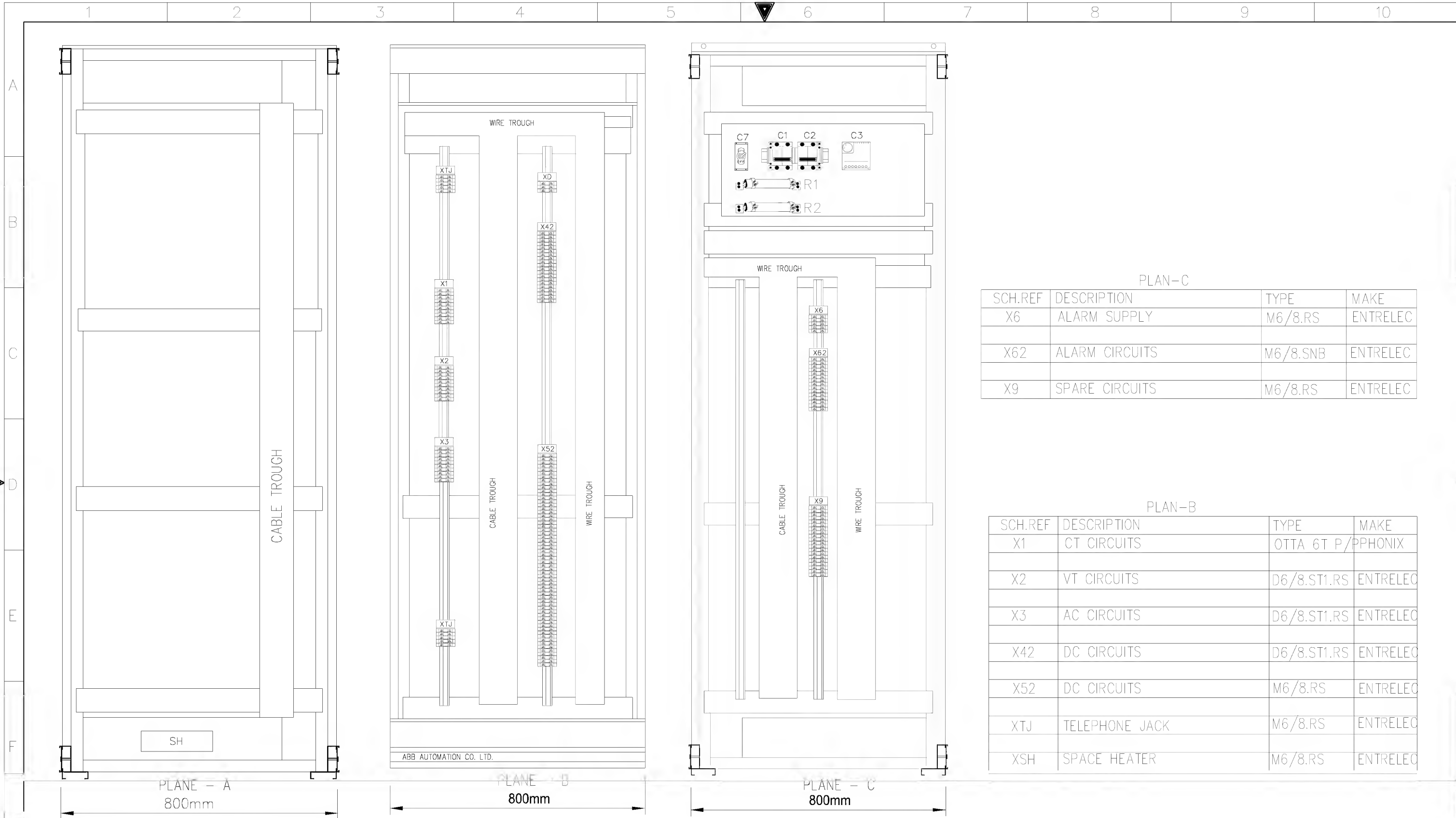
| | | | | |
|------------------------------|-----------|------------------|-----------|-----------|
| الشركة الوطنية لنقل الكهرباء | | National Grid sa | | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| - | C421 | CD-322914 | SHT L07 | CONT. NIL |
| | | | 01 | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|--|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A |  | | POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656 | | | | | ABB AUTOMATION COMPANY LTD., 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A | | |
| B | | | | | | | | | | |
| C | CONTRACTOR : ABB Contracting Company | | | | | | | | | |
| | CLIENT : National Gridsa | | | | | | | | | |
| D | PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY | | | | | | | | | |
| | SUBSTATION : S/S 8709 | | | | | | | | | |
| E | CONTRACT NO. : 11131113/00 | | | | | | | | | |
| F | TITLE : Assembly Drawing +R02.2 [Under Ground Feeder] | | | | | | | | | |

| | | | | | | | | | | | |
|---|------------------------------|-------|--------------------------|-------------------------|---------------------|--------------------------------------|---|-----------|----------------|-----------|-----------|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 | COVER SHEET | |  نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR | 132kV UGF-8020 RELAY PANEL-2 +R02.2 | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| | 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED | S/S 8709-132/13.8KV IN AL-KHARJ CITY | - | C421 | CD-322915 | SHT G00 | CONT. G01 |
| | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC | RIYADH SAUDI ARABIA | | | | | 01 |



| | | | | | | | | | | | | |
|---|------------------------------|-------|---------------------------------|--------------------------------------|--|---------------------|--------------------------------------|-------|--|----------------|-----------|----------|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | ASSEMBLY DRAWING | | <div>نقل الكهرباء</div> <div>National Grid sa</div> <div></div> <div>الشركة الوطنية لنقل الكهرباء</div> | | | |
| | 01 | 13 49 | FACTORY ASBUILT FOR APPROVAL | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-2 +R02.2 | | | | | |
| | 00 | 13 04 | | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | |
| | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| | | | | | | | - | C421 | CD-322915 | SHT G01 | CONT. G02 | 01 |



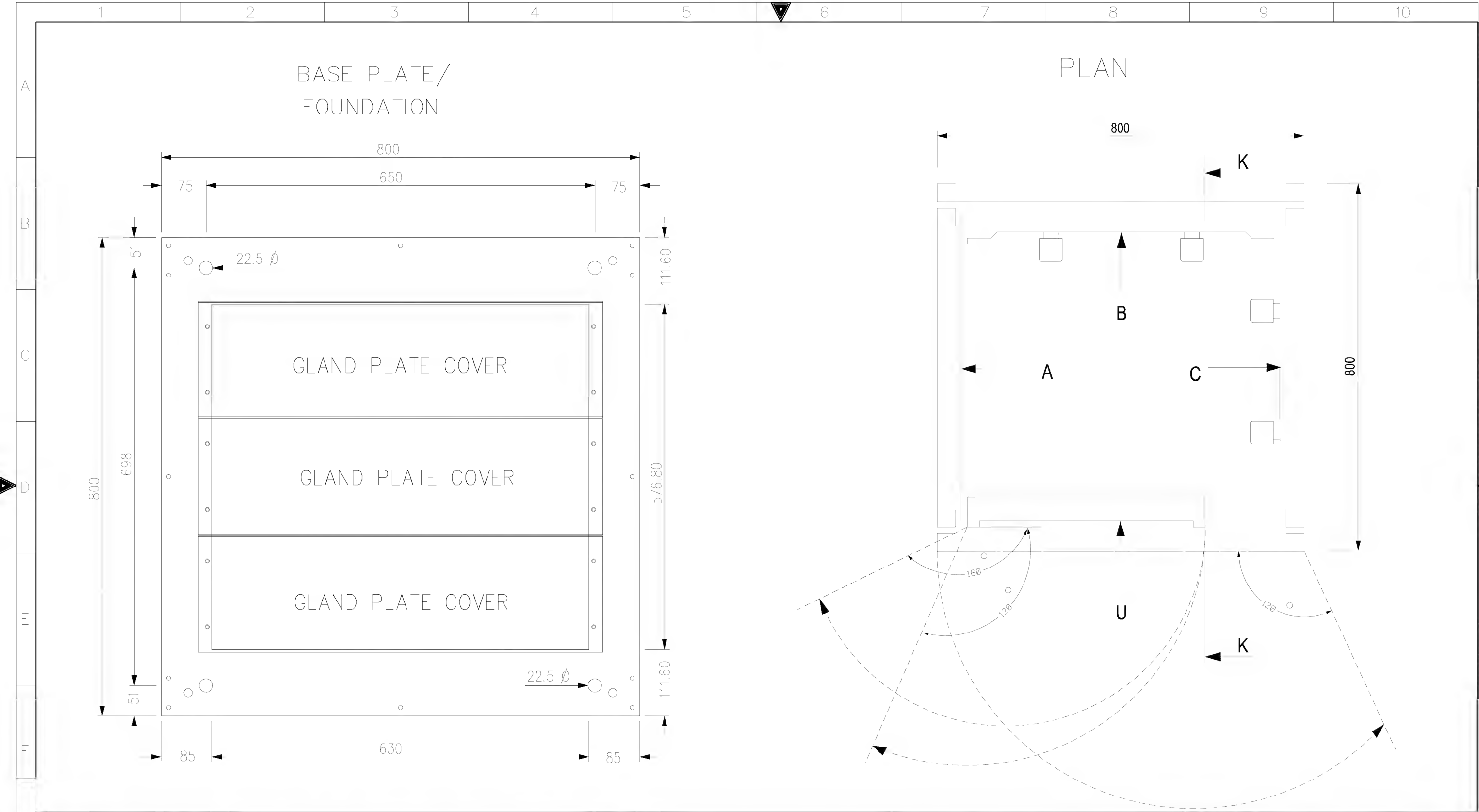
PLAN-C

| SCH.REF | DESCRIPTION | TYPE | MAKE |
|---------|----------------|----------|----------|
| X6 | ALARM SUPPLY | M6/8.RS | ENTRELEC |
| X62 | ALARM CIRCUITS | M6/8.SNB | ENTRELEC |
| X9 | SPARE CIRCUITS | M6/8.RS | ENTRELEC |

PLAN-B

| SCH.REF | DESCRIPTION | TYPE | MAKE |
|---------|----------------|-------------------|----------|
| X1 | CT CIRCUITS | OTTA 6T P/PPHONIX | |
| X2 | VT CIRCUITS | D6/8.ST1.RS | ENTRELEC |
| X3 | AC CIRCUITS | D6/8.ST1.RS | ENTRELEC |
| X42 | DC CIRCUITS | D6/8.ST1.RS | ENTRELEC |
| X52 | DC CIRCUITS | M6/8.RS | ENTRELEC |
| XTJ | TELEPHONE JACK | M6/8.RS | ENTRELEC |
| XSH | SPACE HEATER | M6/8.RS | ENTRELEC |

| | | | | | | | | | | | | | | | | |
|---|------------------------------|-------|---------------------------------|--|--|--|--------------------------------------|--|---|--|-----------|----------------|--|-----------|--|----------|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | ASSEMBLY DRAWING | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div> | | | | | | | |
| | 01 | 13 49 | FACTORY ASBUILT FOR APPROVAL | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-2 +R02.2 | | INDEX | | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| | 00 | 13 04 | | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | | | SHT CONT. | | |
| | REV. NO. | DATE | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | - | | C421 | CD-322915 | | G02 G03 | | 01 |



| | | | | | | |
|------------------------------|-------|---------------------------------|--------------------------|--|-----------------------|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| 01 | 13 49 | FACTORY ASBUILT FOR APPROVAL | DRAWN BY RIZ | | CHECKED BY KVR | |
| 00 | 13 04 | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | |

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|--------------------------------------|--------------|
| ASSEMBLY DRAWING | |
| 132kV UGF-8020 RELAY PANEL-2 +R02.2 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH | SAUDI ARABIA |

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|------------------------------|-----------|---|-----------|------------------|----------|
| الشركة الوطنية لنقل الكهرباء | |  | | نقل الكهرباء | |
| | | | | National Grid SA | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | | REV. NO. |
| - | C421 | CD-322915 | SHT | CONT. | 01 |
| | | | G03 | G04 | |

A

B

C

D

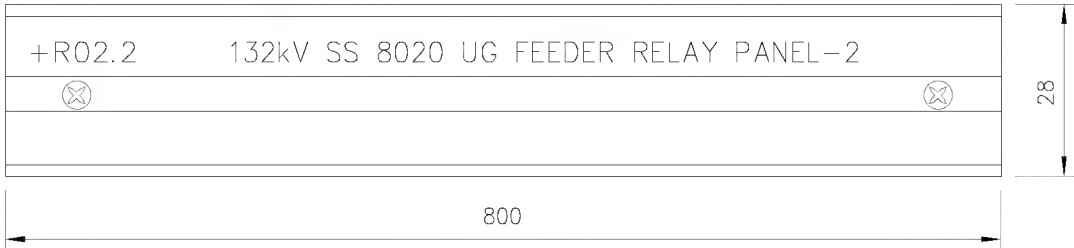
E

F



TOP VIEW FOR EARTHING BAR

U PLANE TOP LABEL



U PLANE BOTTOM LABEL



MANUFACTURING LABEL

ABB

ABB Automation Co.Ltd.

PROJECT :

National Grid SA
S/S 8709

ORDER REFERENCE :

2875 RF S13656

YEAR OF MANUFACTURE:

2013

PANEL NO. :

+R02.2

DRAWING NO. :

S13656-CD-323916

MADE IN THE KINGDOM OF SAUDI ARABIA


AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | |
|----------|-------|-----------------|
| 01 | 13 49 | FACTORY ASBUILT |
| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

| | | | |
|--------------|------------|----------------|----------|
| DRAWN BY | RIZ | CHECKED BY | KVR |
| DATE STARTED | 24.01.2013 | DATE COMPLETED | |
| OPRG. DEPT. | CTPD | ENG. DEPT. | AUT-PSAC |

| | |
|--------------------------------------|--|
| ASSEMBLY DRAWING | |
| 132kV UGF-8020 RELAY PANEL-2 +R02.2 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH SAUDI ARABIA | |

| | | | | | |
|------------------------------|-----------|----------------|--|------------------|-------|
| الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | | National Grid sa | |
| INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | |
| - | C421 | CD-322915 | | SHT | CONT. |
| | | | | G04 | L00 |
| | | | | REV. NO. | |
| | | | | 01 | |


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|---|---|---|---|---|---|---|---|--|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A |  | | POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656 | | | | | ABB AUTOMATION COMPANY LTD., 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A | | |
| B | | | | | | | | | | |
| C | CONTRACTOR : ABB Contracting Company | | | | | | | | | |
| | CLIENT : National Gridsa | | | | | | | | | |
| D | PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY | | | | | | | | | |
| | SUBSTATION : S/S 8709 | | | | | | | | | |
| E | CONTRACT NO. : 11131113/00 | | | | | | | | | |
| F | TITLE : LIST OF APPARATUS +R02.2 [Under Ground Feeder] | | | | | | | | | |

| | | | | | | | | | | | |
|---|------------------------------|-------|--------------------------|-------------------------|---------------------|--------------------------------------|---|-----------|----------------|-----------|-----------|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 | COVER SHEET | |  نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR | 132kV UGF-8020 RELAY PANEL-2 +R02.2 | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| | 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED | S/S 8709-132/13.8KV IN AL-KHARJ CITY | - | C421 | CD-322915 | SHT L00 | CONT. L01 |
| | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC | RIYADH SAUDI ARABIA | | | | | 01 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
|---------|----------|-----------|--|---|-----|------|----------|--------|--------------------|-------------------|
| SR. NO. | LOC. REF | SCH. REF. | D E S C R I P T I O N | | SHT | QTY. | TYPE | MAKE | ORD INFORMATION | COUNRTY OF ORIGIN |
| | | | RELAY CUBICLE- +R02.2 ACCOMODATING THE FOLLOWING | | | 1 | | | | |
| A | 1 | U05.5001 | 87L-2 | NUMERICAL HIGH SPEED CURRENT DISTANCE PROTECTION | 498 | 1 | P546 | ALSTOM | P54631NK6M0710M | UK |
| | | | | VERSION : 1 & 3 POLE TRIPPING/RECLOSING MHO/QUAD CHAR | | | | | | |
| | | | | AUX : 110V-250V DC : 100-120V | | | | | | |
| | | | | In/Vn : DUAL RATED CT (1/5A) | | | | | | |
| | | | | HARDWARE : EHTHER NET (100mbits) PLUS irig-b modulated | | | | | | |
| | | | | PRODUCT OPTION : CH1-1300nm SINGLE MODE | | | | | | |
| B | | | | CH2-1300nm SINGLE MODE | | | | | | |
| | | | | PROTOCOL OPTION : IEC61850+COURIER VIA REAR RS485 PORT | | | | | | |
| | | | | MOUNTING : 19" RACK,2A LOGICAL INPUTS,32 RELAY OUT PUTS | | | | | | |
| | | | | LANGUAGE : ENGLISH | | | | | | |
| | | | | SOFTWARE : 71 | | | | | | |
| | | | | | | | | | | |
| C | 2 | U12.5001 | TS-1 | TEST SWITCH FOR P546 RELAY | 422 | 2 | MMLG02 | ALSTOM | MMLG02 R1AA 0001E | UK |
| | | U12.5002 | TS-2 | | | | | | | |
| | | | | | | | | | | |
| | 3 | U16.5001 | S03 | PUSH BUTTON FOR FPSM IN SELECTION | 432 | 1 | MP1-10B | ABB | 1SFA 611 100 R1006 | SWEDEN |
| | | | | BUTTON COLOUR : BLACK | | | MCBH-20 | | 1SFA 611 605 R1102 | |
| | | | | CONTACT DATA : 1NO + 1NC | | | | | | |
| D | 4 | U16.5002 | S04 | PUSH BUTTON FOR FPSM OUT SELECTION | 432 | 1 | MP1-10B | ABB | 1SFA 611 100 R1006 | SWEDEN |
| | | | | BUTTON COLOUR : BLACK | | | MCBH-20 | | 1SFA 611 605 R1102 | |
| | | | | CONTACT DATA : 1NO + 1NC | | | | | | |
| | 5 | U16.5003 | S86BU | PUSH BUTTON FOR 86BU RESET | 443 | 1 | MP1-10B | ABB | 1SFA 611 100 R1006 | SWEDEN |
| | | | | BUTTON COLOUR : BLACK | | | MCBH-20 | | 1SFA 611 605 R1102 | |
| | | | | CONTACT DATA : 1NO + 1NC | | | | | | |
| E | 6 | U16.5004 | S86F2 | PUSH BUTTON FOR 86F2 RESET | 432 | 1 | MP1-10B | ABB | 1SFA 611 100 R1006 | SWEDEN |
| | | | | BUTTON COLOUR : BLACK | | | MCBH-20 | | 1SFA 611 605 R1102 | |
| | | | | CONTACT DATA : 1NO + 1NC | | | | | | |
| | 7 | U16.5005 | LT | PUSH BUTTON FOR 86F2 RESET | 431 | 1 | MP1-10B | ABB | 1SFA 611 100 R1006 | SWEDEN |
| | | | | BUTTON COLOUR : BLACK | | | MCBH-20 | | 1SFA 611 605 R1102 | |
| | | | | CONTACT DATA : 1NO + 1NC | | | | | | |
| F | 8 | U16.5006 | L01 | INDICATION LAMP OUT | 431 | 1 | MC1-100W | ABB | 1SFA 611 400 R1003 | SWEDEN |
| | | | | LENS : WHITE | | | MCBH-003 | | 1SFA 611 605 R1400 | |
| | | | | LENS RATING 110-130V,4-6MA | | | KA2-2145 | | 1SFA 616 921 R2145 | |
| | | | HOLDER RATING :130V WITH RESISTORS DIODE BLOCK | | | | | | | |

| | | | | | | | | | | | | |
|------------------------------|--|--|--------------------------|--|-----------------------|--|--------------------------------------|--|------------------------------|--|----------------|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COVER SHEET | | الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | |
| | | | DRAWN BY RIZ | | CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-2 +R02.2 | | National Grid sa | | | |
| | | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | INDEX | | PLANT NO. | |
| | | | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | | RIYADH | | SAUDI ARABIA | | DRAWING NUMBER | |
| | | | | | | | | | - C421 | | CD-322915 | |
| | | | | | | | | | SHEET NO. | | REV. NO. | |
| | | | | | | | | | SHT | | CONT. | |
| | | | | | | | | | L01 | | L02 | |
| | | | | | | | | | | | 01 | |

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|---|---------|----------|-----------|--|---------|------|--------|------|-----------------|-------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A | | | | | | | | | | |
| B | | | | | | | | | | |
| C | SR. NO. | LOC. REF | SCH. REF. | D E S C R I P T I O N | SHT | QTY. | TYPE | MAKE | ORD INFORMATION | COUNRTY OF ORIGIN |
| | 12 | U29.101 | 74R2/74R3 | RELAY CUBICLE- +R02.2 ACCOMODATING THE FOLLOWING | 432,443 | 2 | RXSF 1 | ABB | RK 271 019-AN | SWEDEN |
| | | U29.119 | 74IT2 | DUAL COIL RELAY FOR + R2/R3 DC SUPERVISION | 433 | | | | | |
| | | | | AUXILIARY VOLTAGE : 110-125VDC | | | | | | |
| D | | | | CONTACT DATA : 1NO + 2NC PER COIL | | | | | | |
| | 13 | U29.107 | K01S | BISTABLE RELAY FOR "IN/OUT SELECTION" | 432 | 1 | RXMVB4 | ABB | 1MRK 251 401 AP | SWEDEN |
| | | | | AUXILIARY VOLTAGE : 110 - 125V DC | | | | | | |
| | | | | OUTPUT CONTACTS : 7NO + 7NC | | | | | | |
| E | 14 | U29.301 | TMR/86F2 | DELAY ON PICKUP DELAY FOR RESET 86F2 | 432 | 1 | RXKL1 | ABB | 1MRK 000-066-AB | SWEDEN |
| | | | | AUXILIARY VOLTAGE : 110-125VDC | | | | | | |
| | | | | CONTACT DATA : 2 C/O | | | | | | |
| | | | | TIMER RANGE : 20MS-99 hrs | | | | | | |
| F | | | | | | | | | | |

| | | | | | | | | | | | | |
|------------------------------|-------|--------------------------|--|--|--|--------------------------------------|--|--|-----------|----------------|-----------|----------|
| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | LIST OF APPARATUS | | <div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء National Grid sa</div> | | | | |
| 01 | 13 49 | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-2 +R02.2 | | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| 00 | 13 04 | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | SHT | CONT. |
| REV. NO. | DATE | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | - | C421 | CD-322915 | L03 | L04 |
| | | | | | | | | | | | | 01 |

NG/D2-D (2012/01)

DMS VECTOR

NGD200

| | | | | | | | | | | | | | | |
|---|------------------------------|----------|--------------------------|---|--|-----------|--------------------------------------|--------------------|--|--|-------------------|-----------|-----------|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | | | |
| A | SR. NO. | GA REF. | SCH. REF. | DESCRIPTION | | SHEET NO. | QTY. | TYPE | MAKE | ORDERING INFORMATION | COUNTRY OF ORIGIN | | | |
| | 15 | | | MCB 2 POLE 6A, FOR DC SUPPLY WITH 2NC AUXILIARY CONTACT | | 416 | 4 | S 282 UC-K6 S2-H02 | ABB | GH S282 0164 R0377 GH S270 1916 R0003 | GERMANY | | | |
| | | U39.5001 | Q1 | Q1 R2± SUPPLY | | | | | | | | | | |
| | | U39.5002 | Q2 | Q2 R3 ± SUPPLY | | | | | | | | | | |
| B | | U36.5001 | Q3 | Q3 IT2+ SUPPLY | | | | | | | | | | |
| | | U36.5002 | Q4 | Q4 TC2 + SUPPLY | | | | | | | | | | |
| | 16 | U39.5003 | C01 | CONVENIENCE OUTLET 10A, 127V AC | | 411 | 1 | USM45 & USMS45 | LEGRAND | 74140 & 74180 | FRANCE | | | |
| | | | C02 | CONVENIENCE OUTLET 10A, 220V AC | | | | | | | | | | |
| C | | | C1,C2 | MINIATURE CIRCUIT BREAKER, 2 POLE, 10A FOR CONVENIENCE OUTLET WITH AUXILIARY SWITCH, 1NO + 1NC CONTACTS | | 411 | 2 | S202P-K10 S2C-H11L | ABB | 2CDS 253 001 R0104 2CDS 200 936 R0001 | GERMANY | | | |
| | 17 | | C3 | THERMOSTAT FOR SPACE HEATER, 5-60° C | | 411 | 1 | SK 3110 | RITTAL | SK 3110 | THIWAN | | | |
| | 18 | U39.5004 | TJ | TELEPHONE JACK 1GANG 4WIRE | | 411 | 1 | EDF410 | EDISON | EDF410 | SWEDEN | | | |
| | 19 | | C7 | ON/OFF SWITCH FOR SPACE HEATER | | 411 | 1 | M2SS1-10B MCBH-10 | ABB | 1SFA 611 200 R1006 1SFA 611 605 R1101 | | | | |
| D | 20 | | DS | DOOR SWITCH FOR CONTROL OF CUBICLE INTERNAL ILLUMINATION LAMP | | 411 | 1 | LS30PKB1302 | ABB | 1SBV 010213 R1202 | SWEDEN | | | |
| | 21 | | IL | INTERNAL ILLUMINATION CUBICLE LAMP SUITABLE FOR 127V AC, 60Hz SUPPLY, 20W | | 411 | 1 | T-4 | SUNON | SP-20W | | | | |
| | 22 | | SH | SPACE HEATER, 150W, 120V, 60Hz | | 411 | 1 | RICA | GRUPPO | 1FZEK 006 C001 | ITALY | | | |
| | 23 | | R1 | FIXED RESISTOR FOR TRIP CIRCUIT SUPERVISION CKT. | | 491 | 2 | GRF 30/200 | DANOTHERM | GRF 30/200 | GERMANY | | | |
| E | | | R2 | 2.5Kohm,15W | | | | | | | | | | |
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| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | LIST OF APPARATUS | | الشركة الوطنية لنقل الكهرباء National Grid sa | | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-2 +R02.2 | | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. | |
| | 00 | 13 04 | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | - | C421 | CD-322915 | SHT L04 | CONT. L05 | 01 |
| | REV. NO. | DATE | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | | | | | | |

NG/D2-D (2012/01)


DMS VECTOR

NGD200

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| SR. NO. | ITEM DESIGNATION | D E S C R I P T I O N | SHEET.NO. | QTY. | TYPE | MAKE | ORDERING INFORMATION | COUNTRY OF ORIGIN |
|---------|------------------|--|-----------|------|-----------------------------|--------------------------|-------------------------------|-------------------|
| 24 | X1 | BOLT CONNECTING TERMINAL BLOCKS FOR DISCONNECTABLE CT CIRCUITS | 501 | 10 | OTTA 6T P/P | PHOENIX | 0790462 | GERMANY |
| | X2 | SPRING LOADED TERMINAL BLOCKS FOR DISCONNECTABLE VT CIRCUITS | 501 | 5 | D6/8.ST1.RS | ENTRELEC | 1SNA 115 831 R0400 | FRANCE |
| | X3 | SPRING LOADED TERMINAL BLOCKS FOR DISCONNECTABLE AC CIRCUITS | 501 | 10 | D6/8.ST1.RS | ENTRELEC | 1SNA 115 831 R0400 | FRANCE |
| | X42 | SPRING LOADED TERMINAL BLOCK FOR DISCONNECTABLE DC CIRCUITS | 501 | 50 | D6/8.ST1.RS | ENTRELEC | 1SNA 115 831 R0400 | FRANCE |
| | X52 | SPRING LOADED TERMINAL BLOCK FOR DC PROTN. CIRCUITS | 501 | 50 | M6/8.RS | ENTRELEC | 1SNA 115 688 R2500 | FRANCE |
| | X62,X6 | KNIFE TYPE TERMINAL BLOCKS FOR COMMON ALARM CIRCUITS | 501 | 15,5 | M6/8.SNB | ENTRELEC | 1SNA 115 685 R1200 | FRANCE |
| | X9 | SPRING LOADED TERMINAL BLOCKS FOR SPARE CIRCITS | 501 | 15 | M6/8.RS | ENTRELEC | 1SNA 115 688 R2500 | FRANCE |
| | XTJ | SPRING LOADED TERMINAL BLOCKS FOR TELEPHONE JACK | 501 | 5 | M6/8.RS | ENTRELEC | 1SNA 115 688 R2500 | FRANCE |
| | XSH | SPRING LOADED TERMINAL BLOCKS FOR SPACE HEATER | 501 | 3 | M6/8.RS | ENTRELEC | 1SNA 115 688 R2500 | FRANCE |
| | XD | TERMINAL BLOCKS WITH BLOCKING DIODE | 501 | 3 | M4/6.S IN5408 V150ZA1 | ENTRELEC MEJDAF RS | 11521310 02-049 239-270 | FRANCE |
| | X6 | SPRING LOADED TERMINAL BLOCKS FOR ALARM CIRCITS | 501 | 5 | M6/8.RS | ENTRELEC | 1SNA 115 688 R2500 | FRANCE |

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| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | LIST OF APPARATUS | | الشركة الوطنية لنقل الكهرباء | |  نقل الكهرباء National Grid sa | | | | |
| | 01 | 13 49 | FACTORY ASBUILT FOR APPROVAL | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-2 +R02.2 | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| | 00 | 13 04 | | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | - | C421 | CD-322915 | | SHT | CONT. | 01 |
| | REV. NO. | DATE | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | | | | | L05 | L06 | |

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| LABEL REF. | LABEL ENGRAVING | MATERIALS | ENGRAVING | LABEL SIZE | LETTER SIZE |
|------------|----------------------|---------------------|--------------------------------------|------------|-------------|
| U05.5001 | U05.5001 87L-2 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U12.5001 | U12.5001 TS-1 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X15mm | 4mm |
| U12.5002 | U12.5002 TS-2 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X15mm | 4mm |
| U16.5001 | U16.5001 S03 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U16.5002 | U16.5002 S04 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U16.5003 | U16.5003 S86BU | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U16.5004 | U16.5004 S86F2 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 3mm |
| U16.5005 | U16.5005 LT | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U16.5006 | U16.5006 L01 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U25.5001 | U25.5001 86F2 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U25.5002 | U25.5002 85R2 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U25.5003 | U25.5003 86BU | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X10mm | 4mm |
| U29.101 | U29.101 74R2/74R3 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.107 | U29.107 K01S | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.301 | U29.301 TMR/86F2 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.125 | U29.125 74IT2 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.119 | U29.119 R1 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |
| U29.319 | U29.319 R2 | ALUMINUM PAPER FOIL | BLACK LETTERS | 50X10mm | 3mm |

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

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| 01 | 13 49 | FACTORY ASBUILT |
| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

DRAWN BY RIZ CHECKED BY KVR
DATE STARTED 24.01.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

LIST OF APPARATUS
132kV UGF-8020 RELAY PANEL-2 +R02.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

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| الشركة الوطنية لنقل الكهرباء | | National Grid sa | | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| - | C421 | CD-322915 | SHT L06 CONT. L07 | 01 |

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| LABEL REF. | LABEL ENGRAVING | MATERIALS | ENGRAVING | LABEL SIZE | LETTER SIZE |
|------------|--------------------------|-----------|--------------------------------------|------------|-------------|
| C1 | C1 127V AC SUPPLY MCB | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| C2 | C2 220V AC SUPPLY MCB | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| C3 | C3 THERMOSTAT | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| C7 | C7 ON/OFF SWITCH | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| DS | DS DOOR SWITCH | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| IL | IL ILLUMINATION LAMP | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| SH | SH SPACE HEATER | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5001 | U39.5001 Q1 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5002 | U39.5002 Q2 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5003 | U39.5003 C01/C02 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U39.5004 | U39.5004 YJ | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U36.5001 | U36.5001 Q3 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| U36.5002 | U36.5002 Q4 | TRAFOLITE | BLACK LETTERS ON WHITE BACKGROUND | 50X15mm | 4mm |
| | | | | | |

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

01

13 49

FACTORY ASBUILT

00

13 04

FOR APPROVAL

REV. NO.

DATE

DESCRIPTION

DRAWN BY RIZ

CHECKED BY KVR

DATE STARTED 24.01.2013

DATE COMPLETED _____

OPRG. DEPT. CTPD

ENG. DEPT. AUT-PSAC


LIST OF APPARATUS

132kV UGF-8020 RELAY PANEL-2 +R02.2

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء

National Grid sa

INDEX

PLANT NO.

DRAWING NUMBER

SHEET NO.

REV. NO.

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C421


CD-322915

SHT

CONT.


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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A |  | | POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656 | | | | | ABB AUTOMATION COMPANY LTD. 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A | | |
| B | | | | | | | | | | |
| C | | | | | | | | | | |
| D | CONTRACTOR : ABB Contracting Company | | | | | | | | | |
| | CLIENT : National Gridsa | | | | | | | | | |
| | PROJECT : CONSTRUCTION OF NEW 132/13.8kv SS 8709 IN AL-KHARJ CITY | | | | | | | | | |
| | SUBSTATION : S/S 8709 | | | | | | | | | |
| E | CONTRACT NO. : 11131113/00 | | | | | | | | | |
| F | TITLE : SCHEMATICS DRAWINGS (Under Ground Feeder) | | | | | | | | | |

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|---|------------------------------|-------|--------------------------|-------------------------|---------------------|--------------------------------------|---|-----------|----------------|-----------|-----------|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 | COVER SHEET | |  نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR | 132kv UGF-8020 RELAY PANEL-1/2 | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| | 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED | S/S 8709-132/13.8KV IN AL-KHARJ CITY | - | C421 | CD-322916 | SHT 000 | CONT. 001 |
| | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC | RIYADH | SAUDI ARABIA | | | | 01 |

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| CONTENTS | ABB SHT.NO. | REV.00 | REV.01 | REV.02 |
|---|----------------|--------|--------|--------|
| AC SUPPLY FOR ILLUMINATION & POWER SOCKET | 411 | X | X | |
| AC MCB AUX CONTACTS | 412 | X | X | |
| AC MCB AUX CONTACTS | 416 | X | X | |
| CURRENT TRANSFORMER INPUTS -87L-2 | 421 | X | X | |
| VOLTAGE TRANSFORMER INPUTS - 87L-2 | 422 | X | X | |
| COMMUNICATION CIRCUIT - 87L2 | 423 | X | X | |
| MAIN-2 PROT. 87L-2 RELAY BINARY INPUTS | 431 | X | X | |
| MAIN-2 DIFF. PROTECTION TRIP RELAY CKT. | 432 | X | X | |
| MAIN-2 INTERTRIP RELAY CKT. | 433 | X | X | |
| BACKUP PROTECTION TRIP RELAY CIRCUIT | 443 | X | X | |
| OPTICAL / ELECTRICAL INTERFACE | 446 | X | X | |
| MAIN-2 INDICATION CKT. | 478 | X | X | |
| TRIP COIL-2 SUPERVISION CIRCUIT | 491 | X | X | |
| TRIP COIL-1 & CBF INITIATION CONTACTS | 492 | X | X | |
| CLOSING CIRCUIT | 493 | X | X | |
| COMMON ALARM CIRCUITS | 494 | X | X | |
| SPARE CONTACTS | 495 | X | X | |
| BLOCK REFERENCE-87L-2 | 498 | X | X | |
| BLOCK REFERENCE-87L-2 | 499 | X | X | |
| TERMINAL BLOCKS REFERENCE +R02.2 | 501 | X | X | |
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| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 | CONTENTS SHEET | | <div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء National Grid sa</div> | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR | 132kV UGF-8020 RELAY PANEL-1/2 | INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | |
| | 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED | S/S 8709-132/13.8KV IN AL-KHARJ CITY | - | C421 | CD-322916 | SHT | CONT. |
| | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC | RIYADH SAUDI ARABIA | | | | 002 | 011 |
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NG/D2-D (2012/01)

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| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|--------|---|--------|--|--------|--|
| | FRAME CONNECTION | | MAIN CONTACT OF A CIRCUIT BREAKER | | RELAY WITH TWO MAKE CONTACTS, ONE OF THEM DELAYED WHEN OPERATING |
| | EARTH CONNECTION | | PASSING MAKE CONTACT CLOSING MOMENTARILY DURING OPERATION AND RELEASE | | RELAY WITH TWO ACTUATORS AND A TWO STABLE POSITIONS |
| | RESISTOR | | BREAK CONTACT DELAYED WHEN OPERATING | | RELAY WITH TWO ACTUATORS AND A TWO STABLE POSITIONS |
| | VARIABLE RESISTOR | | MAKE CONTACT DELAYED WHEN RELEASING | | SIGNALLING LAMP |
| | RESISTOR WITH PRESET ADJUSTMENT | | TWO MECHANICAL LINKS CROSSING WITHOUT CONNECTION | | MECHANICAL INDICATOR WITH AUTOMATIC RESET |
| | CAPACITOR | | JUNCTION OF MECHANICAL LINKS | | MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET |
| | SEMICONDUCTOR DIODE USED AS A CAPACITIVE DEVICE | | AUTOMATIC RESET | | ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH AUTOMATIC RESET |
| | OPEN CONTACT, MAKE CONTACT | | NON-AUTOMATIC RESET | | ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET |
| | CLOSED CONTACT, BREAK CONTACT | | SWITCHING DEVICE WITH MANUAL OPERATION AND WITH AUTOMATIC RESET | | RELAY WITH MAKE CONTACT |
| | CHANGE-OVER CONTACT, BREAK BEFORE MAKE | | SWITCHING DEVICE WITH MANUAL OPERATION AND WITH NON-AUTOMATIC RESET | | RELAY WITH CHANGE-OVER CONTACT |
| | MAKE CONTACT WHICH IS EARLY WHEN OPERATING AND LATE WHEN RELEASING | | CHANGE-OVER SWITCHING DEVICE WITH MANUAL CONTROL AUTOMATIC RESET FROM POSITION 1-2 TO THE NEUTRAL POSITION | | RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING |
| | BREAK CONTACT WHICH IS LATE WHEN OPERATING AND EARLY WHEN RELEASING | | RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING | | RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING AND RELEASING |
| | SWITCHING DEVICE WITH MANUAL CONTROL | | RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING AND RELEASING | | ELECTRO-MECHANICAL POSITION INDICATOR WITH ONE DE-ENERGIZED AND ONE OPERATED POSITION |
| | MAKE CONTACT DELAYED WHEN OPERATING | | RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING AND RELEASING | | ELECTRO-MECHANICAL POSITION INDICATOR WITH ONE DE-ENERGIZED AND TWO OPERATED POSITIONS |
| | BREAK CONTACT DELAYED WHEN RELEASING | | BELL, BUZZER | | SIREN, HORN |
| | MAKE CONTACT DELAYED WHEN OPERATING AND RELEASING | | | | |
| | MAIN CONTACT OF A SWITCH DISCONNECTOR | | | | |
| | MAIN CONTACT OF A DISCONNECTOR | | | | |

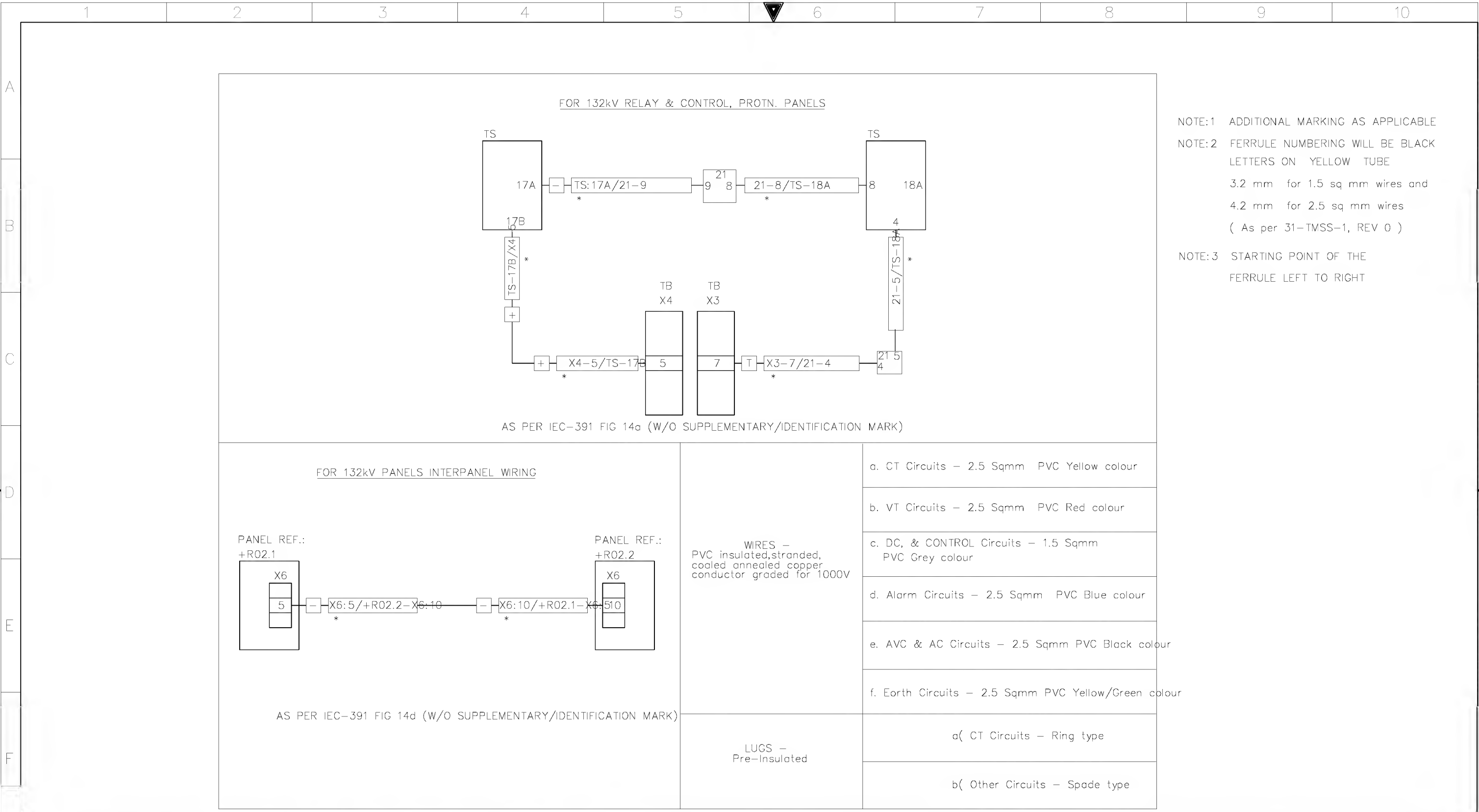
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| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|--------|--|--------|---|--------|--|
| | FUSE / LINK | | WATTMETER | | ELEMENT WITH NEGATED INHIBITING INPUT |
| | FUSE WITH THE SUPPLY SIDE INDICATED | | VARMETER | | ELEMENT WITH INPUT WHICH DOES NOT CARRY ANY LOGIC INFORMATION |
| | SINGLE-PHASE TRANSFORMER WITH TWO SEPARATE WINDINGS (TWO ALTERNATIVE FORMS) | | POWER FACTOR METER | | ELEMENT WITH POSTPONED OUTPUT |
| | SINGLE-PHASE TRANSFORMER WITH THREE SEPARATE WINDINGS (TWO ALTERNATIVE FORMS) | | POSITION INDICATOR | | AND-ELEMENT WITH TWO INPUTS |
| | SINGLE-PHASE TRANSFORMER WITH FERRO MAGNETIC GORE | | SYNCHROSCOPE | | OR-ELEMENT WITH TWO INPUTS |
| | SINGLE-PHASE VOLTAGE TRANSFORMER (MULTI-LINE AND SINGLE-LINE REPRESENTATION) | | RECORDING VOLTMETER | | LOGIC THRESHOLD ELEMENT WITH FOUR INPUTS AND THRESHOLD VALUE 2 |
| | SINGLE-PHASE VOLTAGE TRANSFORMER WITH TWO SECONDARY WINDINGS (MULTI-LINE AND SINGLE-LINE REPRESENTATION) | | RECORDING WATTMETER | | ELEMENT WITH THREE INPUTS FOR "2 AND ONLY 2" |
| | CURRENT TRANSFORMER (MULTI-LINE AND SINGLE-LINE REPRESENTATION) | | HOUR METER | | EXCLUSIVE OR-ELEMENT WITH THREE INPUTS |
| | CURRENT TRANSFORMER WITH TWO CORES (MULTI-LINE AND SINGLE-LINE REPRESENTATION) | | WATT-HOUR METER | | LOGIC IDENTITY ELEMENT WITH THREE INPUTS |
| | CURRENT TRANSFORMER WITH TWO SECONDARY WINDINGS ON ONE GORE (MULTI-LINE AND SINGLE-LINE REPRESENTATION) | | WATT-HOUR METER FOR ENERGY FROM A BUSBAR SYSTEM | | MAJORITY ELEMENT WITH THREE INPUTS |
| | FILTER | | ELEMENT WITH STATIC INPUT | | NEGATOR |
| | HIGH-PASS FILTER | | ELEMENT WITH STATIC NEGATED INPUT | | NAND ELEMENT WITH TWO INPUTS |
| | BAND-PASS FILTER | | ELEMENT WITH STATIC NEGATED OUTPUT | | NOR ELEMENT WITH TWO INPUTS |
| | VOLTMETER | | ELEMENT WITH DYNAMIC INPUT | | BISTABLE ELEMENT |
| | AMMETER | | ELEMENT WITH DYNAMIC NEGATED INPUT | | |
| | | | ELEMENT WITH INHIBITING INPUT | | |

HEREIN ARE THE SOLE PROPERTY OF NATIONAL GRID SA NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.

| | | | | | | | | | | | |
|---|--|---|--|--|--|--|--|---|--|---|--|
| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | <div> <div>  <div> <div>نقل الكهرباء</div> <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div> </div> </div> </div> | | <div> <div>GRAPHICAL SYMBOLS FOR DIAGRAMS</div> <div>132kV UGF-8020 RELAY PANEL-1/2</div> <div>S/S 8709-132/13.8KV IN AL-KHARJ CITY</div> <div>RIYADH SAUDI ARABIA</div> </div> | | <div> <div>INDEX</div> <div>PLANT NO.</div> <div>DRAWING NUMBER</div> <div>SHEET NO.</div> <div>REV. NO.</div> </div> | |
| <div> <div>01</div> <div>13 49</div> <div>FACTORY ASBUILT</div> </div> | | <div> <div>DRAWN BY</div> <div>RIZ</div> <div>CHECKED BY</div> <div>KVR</div> </div> | | <div> <div>DATE STARTED</div> <div>24.01.2013</div> <div>DATE COMPLETED</div> <div></div> </div> | | | | | | | |
| <div> <div>00</div> <div>13 04</div> <div>FOR APPROVAL</div> </div> | | <div> <div>OPRG. DEPT.</div> <div>CTPD</div> <div>ENG. DEPT.</div> <div>AUT-PSAC</div> </div> | | | | <div> <div>-</div> <div>C421</div> <div>CD-322916</div> <div>012</div> <div>013</div> <div>01</div> </div> | | | | | |
| <div> <div>REV. NO.</div> <div>DATE</div> <div>DESCRIPTION</div> </div> | | | | | | <div> <div>NG/D2-D (2012/01)</div> <div>NGD200</div> </div> | | | | | |



NOTE:1 ADDITIONAL MARKING AS APPLICABLE


NOTE:2 FERRULE NUMBERING WILL BE BLACK LETTERS ON YELLOW TUBE

3.2 mm for 1.5 sq mm wires and


4.2 mm for 2.5 sq mm wires

(As per 31-TMSS-1, REV 0)

NOTE:3 STARTING POINT OF THE FERRULE LEFT TO RIGHT

| | | | | | | | | | | | | | | | | | |
|------------------------------|--|--|---|--|---|--|--------------------------------------|--|--|--|-----------|----------------|-----------|-----------|-----|----------|----|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | FERRULE AND WIRING DETAILS | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div> | | | | | | | | |
| | | | DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u> | | 132kV UGF-8020 RELAY PANEL-1/2 | | 132kV UGF-8020 RELAY PANEL-1/2 | | | | | | | | | | |
| 01 13 49 | | | FACTORY ASBUILT | | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | INDEX | | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. | |
| 00 13 04 | | | FOR APPROVAL | | OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u> | | RIYADH | | SAUDI ARABIA | | - | C421 | CD-322916 | | SHT | CONT. | 01 |
| REV. NO. | | | DATE | | DESCRIPTION | | | | | | | | | | 014 | 015 | |

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|---|---|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
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| B | | | | | | | | | | |
| | | | | | | | | | | |
| C | | | | | | | | | | |
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| D | | | | | | | | | | |
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| E | | | | | | | | | | |
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| F | | | | | | | | | | |
| | | | | | | | | | | |


| MANUFACTURER | SCHEMATICS DWG.NO | PANEL DESCRIPTION | PANEL REFERENCE |
|--|-------------------|---|-----------------|
| | | | |
|  PROTECTION & SUBSTATION AUTOMATION | | SS 8709 132kV RELAY PANELS | |
| | CD-322928 | 132/13.8kV GT-1 RELAY PANEL -1 | +R05.1 |
| | | 132/13.8kV GT-1 RELAY PANEL -2 | +R05.2 |
| | CD-322931 | 132/13.8kV GT-2 RELAY PANEL -1 | +R02.1 |
| | | 132/13.8kV GT-2 RELAY PANEL -2 | +R02.2 |
| | CD-322934 | 132/13.8kV GT-3 RELAY PANEL -1 | +R04.1 |
| | | 132/13.8kV GT-3 RELAY PANEL -2 | +R04.2 |
| | CD-322936 | 132/13.8kV TRANSFORMER-1,2& 3 AVC PANEL | +AVC |
| | CD-322922 | 132KV SPARE-1 UGF RELAY PANEL -1 | +R07.1 |
| | | 132KV SPARE-1 UGF RELAY PANEL -2 | +R07.2 |
| | CD-322916 | 132KV 8020 UGF RELAY PANEL -1 | +R02.1 |
| | | 132KV 8020 UGF RELAY PANEL -2 | +R02.2 |
| | CD-322916 | 132KV 8020 UGF RELAY PANEL -1 | +R02.1 |
| | | 132KV 8020 UGF RELAY PANEL -2 | +R02.2 |
| | CD-322925 | 132KV SPARE-2 UGF RELAY PANEL -1 | +R06.1 |
| | | 132KV SPARE-2 UGF RELAY PANEL -2 | +R06.2 |
| | CD-323012 | 132KV FOIP PANEL | +FOIP |
| | CD-322946 | 132kV BUS COUPLER-A | +R130 |
| | CD-322948 | 132kV BUS COUPLER-B | +R230 |
| | CD-322950 | 132kV BUS SECTION | +R120 |
| | CD-322991 | 132kV BUSBAR PROTECTION MAIN-1 CENTRAL UNIT PANEL | +BB1-1 |
| | CD-322993 | 132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL | +BB1-2 |
| | CD-322995 | 132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL | +BB1-3 |
| | CD-322997 | 132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL | +BB1-4 |
| | CD-322999 | 132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL | +BB1-5 |
| | CD-323001 | 132kV BUSBAR PROTECTION MAIN-2 CENTRAL UNIT PANEL | +BB2-1 |
| | CD-323003 | 132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL | +BB2-2 |
| | CD-323005 | 132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL | +BB2-3 |
| | CD-323007 | 132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL | +BB2-4 |
| | CD-323009 | 132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL | +BB2-5 |

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|------------------------------|-------|-----------------|--------------------------|--|-----------------------|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | | CHECKED BY KVR | |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | |

| DRAWING REFERENCES | |
|--------------------------------------|--------------|
| 132kV UGF-8020 RELAY PANEL-1/2 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH | SAUDI ARABIA |

| | | | | | |
|------------------------------|-----------|----------------|---|-------|----------|
| الشركة الوطنية لنقل الكهرباء | | |  نقل الكهرباء National Grid SA | | |
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| - | C421 | CD-322916 | SHT | CONT. | 01 |
| | | | 015 | 016 | |

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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A | | | | | | | | | | |
| B | | | | | | | | | | |
| C | | | | | | | | | | |
| D | | | | | | | | | | |
| E | | | | | | | | | | |
| F | | | | | | | | | | |

| MANUFACTURER | SCHEMATICS DWG.NO | PANEL DESCRIPTION | PANEL REFERENCE |
|--|-------------------|--|-----------------|
|  PROTECTION & SUBSTATION AUTOMATION | | SS 8709 13.8KV RELAY PANELS | |
| | CD-322952 | 13.8KV Capacitor Bank-1 Protection Panel | +CBP-1 |
| | CD-322954 | 13.8KV Capacitor Bank-2 Protection Panel | +CBP-2 |
| | CD-322956 | 13.8KV Capacitor Bank-2 Protection Panel | +CBP-3 |
| | CD-322958 | 13.8 KV ACCS PANEL | +ACCS |
| | CD-322962 | 13.8KV ACSE PANEL | +ACSE |
| | CD-322968 | 13.8KV Under Voltage Load Shedding Panel | +UVLS |
| | CD-322964 | 13.8KV Under Frequency Load Shedding Panel-1 | +UFLS01 |
| | CD-322966 | 13.8KV Under Frequency Load Shedding Panel-2 | +UFLS02 |
| | | | |
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AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

01

13 49

FACTORY ASBUILT

00

13 04

FOR APPROVAL

REV. NO.

DATE

DESCRIPTION

DRAWN BY RIZ

CHECKED BY KVR

DATE STARTED 24.01.2013

DATE COMPLETED

OPRG. DEPT. CTPD

ENG. DEPT. AUT-PSAC

DRAWING REFERENCES

132kV UGF-8020 RELAY PANEL-1/2

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

National Grid sa

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PLANT NO.

DRAWING NUMBER

SHEET NO.

REV. NO.

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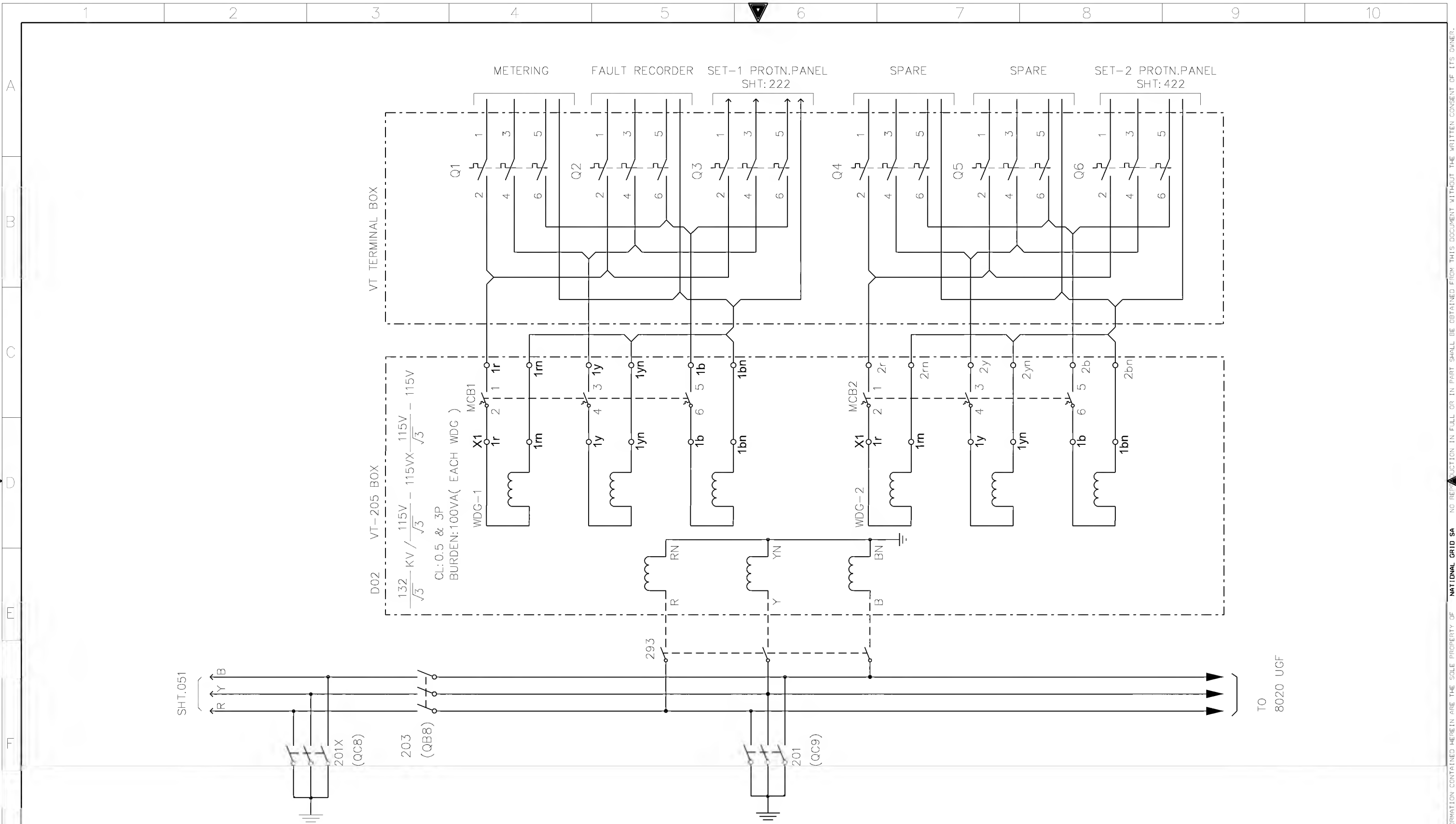
C421

CD-322916

SHT016

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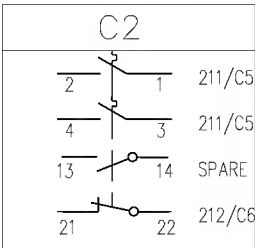
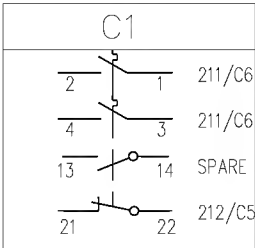
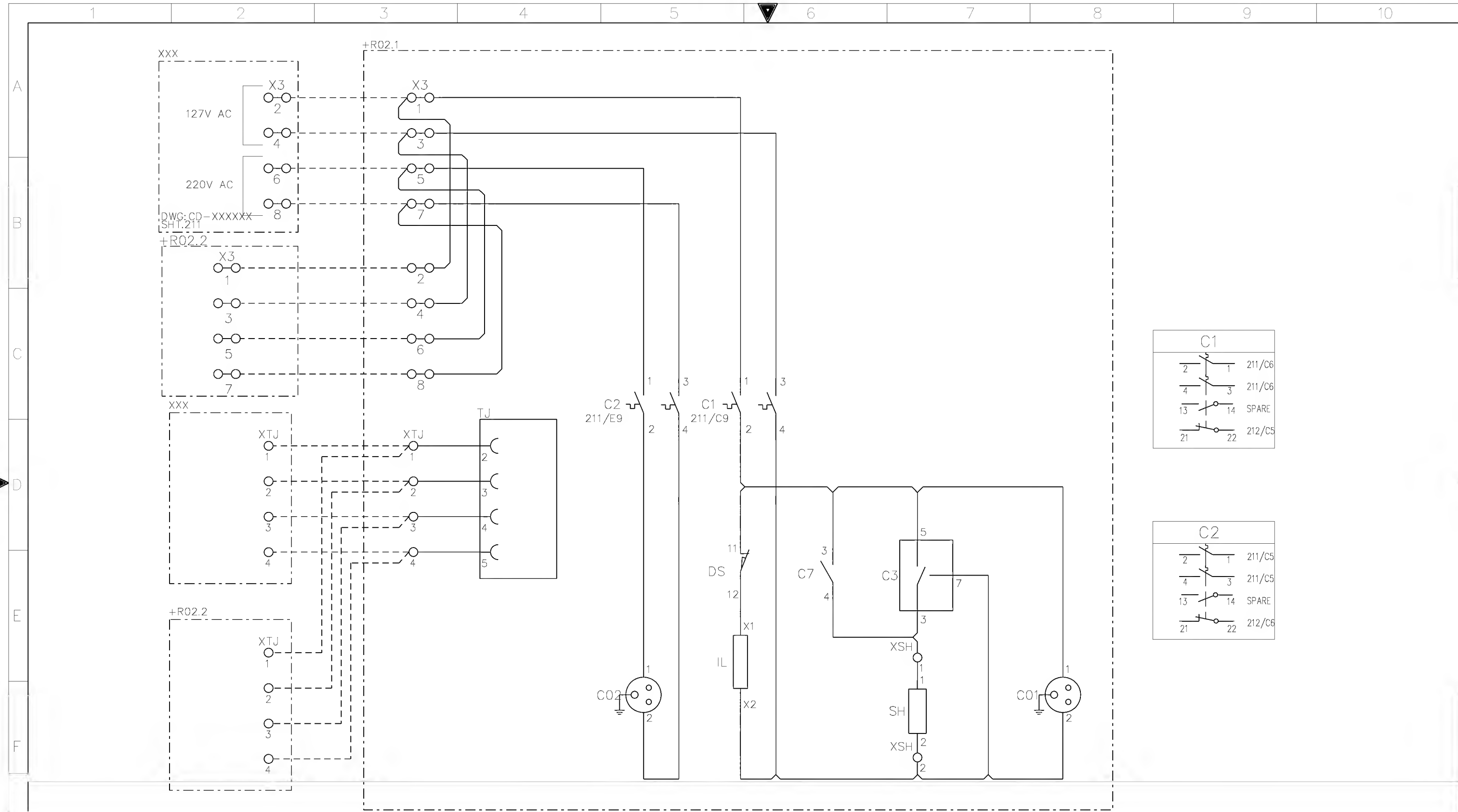


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| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656 |
| 01 | 13 49 | FACTORY ASBUILT | |
| 00 | 13 04 | FOR APPROVAL | |
| REV. NO. | DATE | DESCRIPTION | |

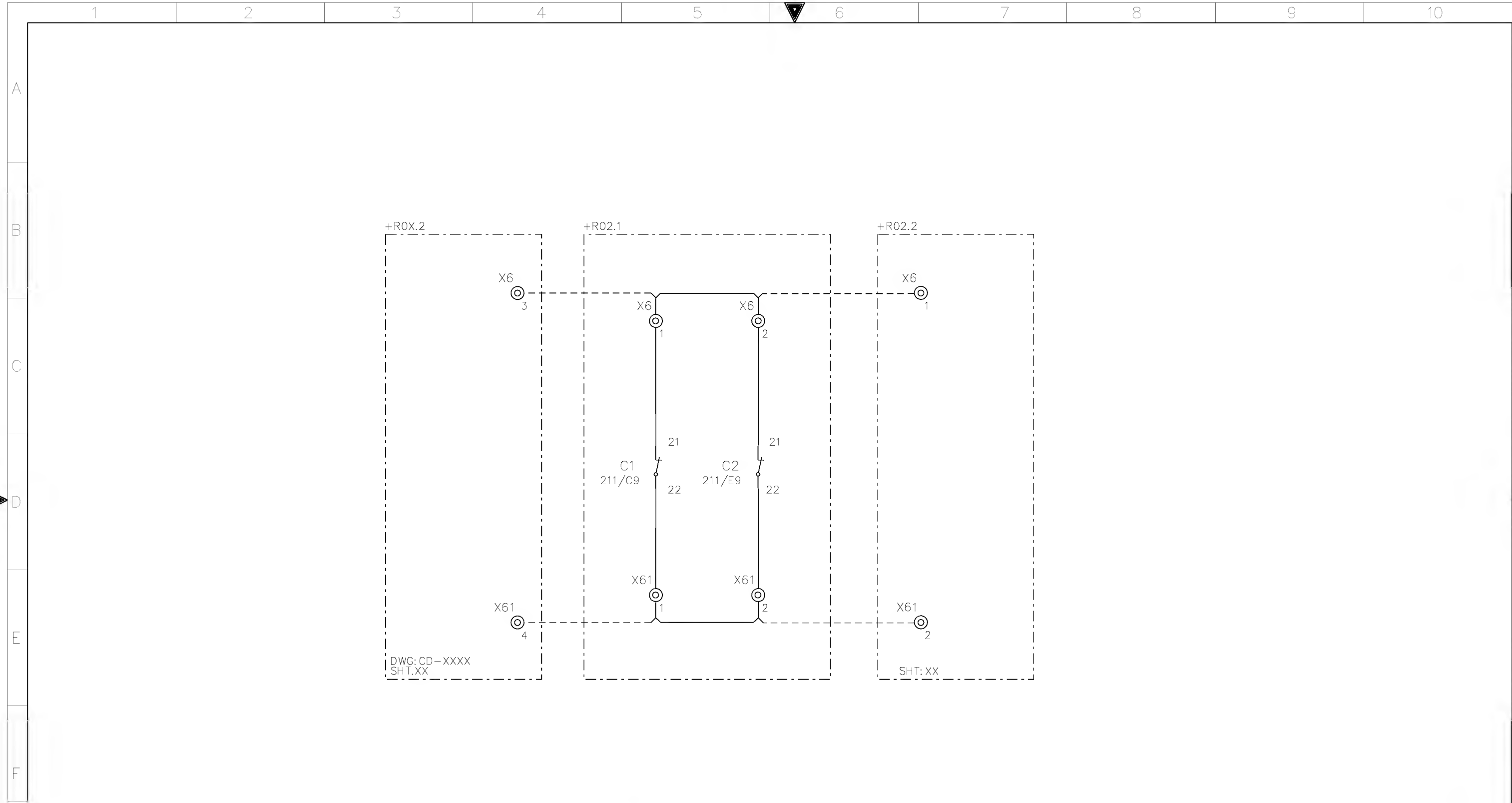
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| DRAWN BY RIZ | | CHECKED BY KVR | |
| DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | |
| OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | |

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| PRIMARY SYSTEM (UG-8020) | |
| 132kV UGF-8020 RELAY PANEL-1/2 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH SAUDI ARABIA | |

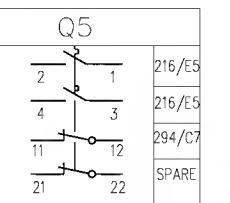
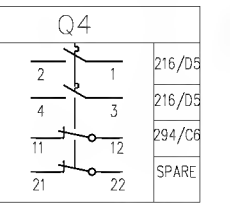
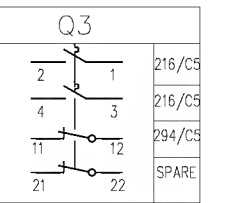
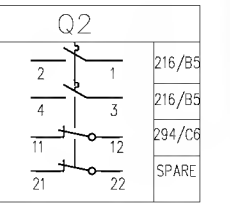
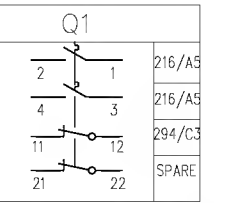
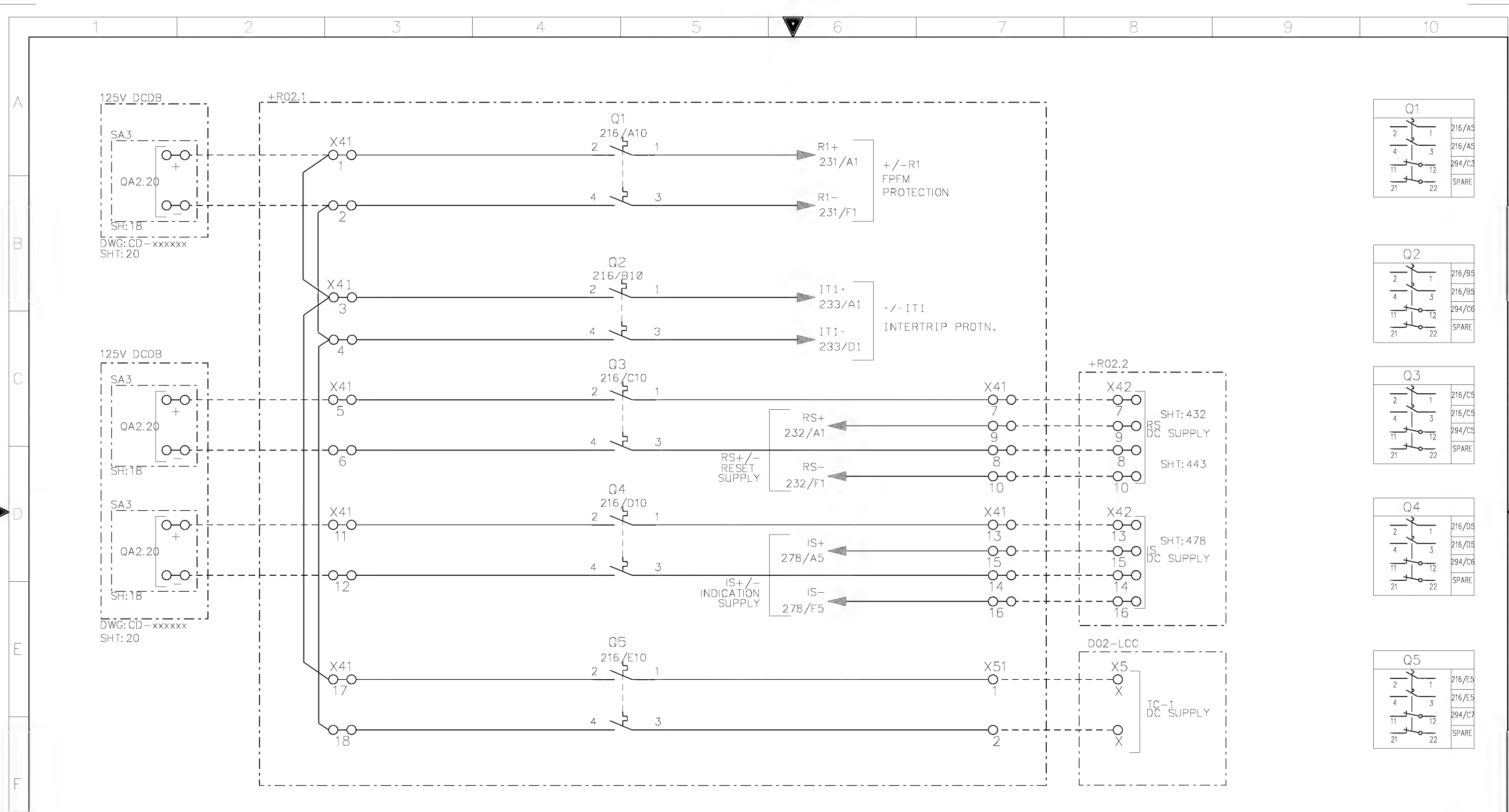
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| الشركة الوطنية لنقل الكهرباء | | National Grid sa | |
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|------------------------------|--|--|---|--|-----------------------|--|--|--|--|---|-----------|----------------|--|-----------|-------|----------|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | AC SUPPLY FOR ILLUMINATION &POWER SOCKET | | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div> | | | | | | |
| | | | DRAWN BY _____ RIZ _____ CHECKED BY _____ KVR | | | | 132kV UGF-8020 RELAY PANEL-1/2 | | | | | | | | | |
| 01 13 49 FACTORY ASBUILT | | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| 00 13 04 FOR APPROVAL | | | | | | | RIYADH SAUDI ARABIA | | | - | C421 | CD-322916 | | SHT | CONT. | 01 |
| REV. NO. | | | DATE | | DESCRIPTION | | OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC | | | | | | | | | |



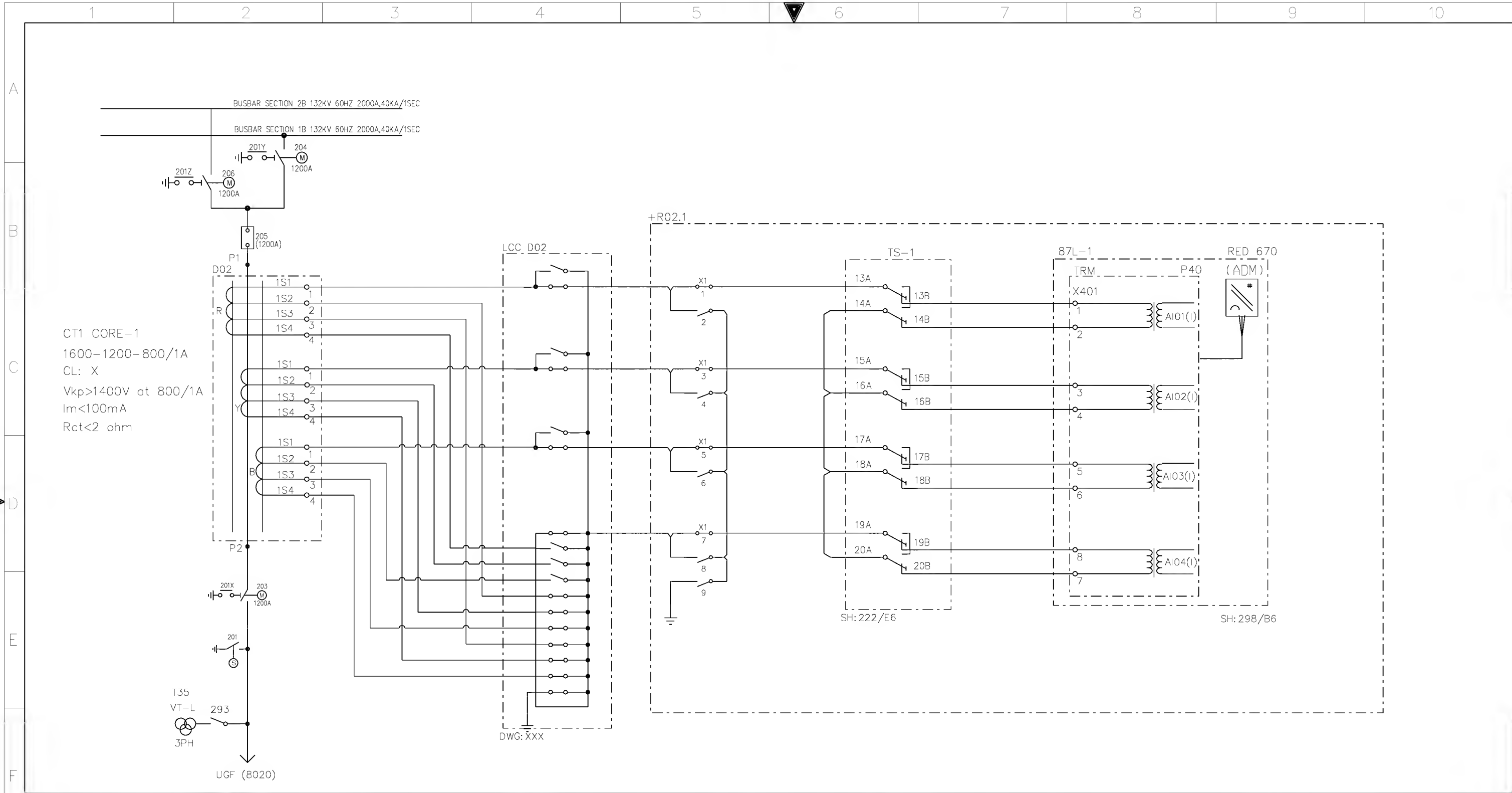
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|---|------------------------------|-------|--------------------------|--|--|--|--------------------------------------|--|---|-----------|----------------|--|-----------|-------|----------|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | AC MCB AUX CONTACTS | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div> | | | | | | |
| | | | | | DRAWN BY _____ RIZ _____ CHECKED BY _____ KVR | | 132kV UGF-8020 RELAY PANEL-1/2 | | | | | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
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| | REV. NO. | DATE | DESCRIPTION | | | | | | | | | | 212 | 216 | |



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|------------------------------|-------|---------------------------------|--------------------------|--|-----------------------|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| 01 | 13 49 | FACTORY ASBUILT FOR APPROVAL | DRAWN BY RIZ | | CHECKED BY KVR | |
| 00 | 13 04 | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | |

| | |
|--------------------------------------|--------------|
| DC SUPPLY DISTRIBUTION | |
| 132kV UGF-8020 RELAY PANEL-1/2 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH | SAUDI ARABIA |

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|------------------------------|-----------|---|--|------------------|-------|----------|
| الشركة الوطنية لنقل الكهرباء | |  | | نقل الكهرباء | | |
| | | | | National Grid SA | | |
| INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| - | C421 | CD-322916 | | SHT | CONT. | 01 |
| | | | | 216 | 221 | |

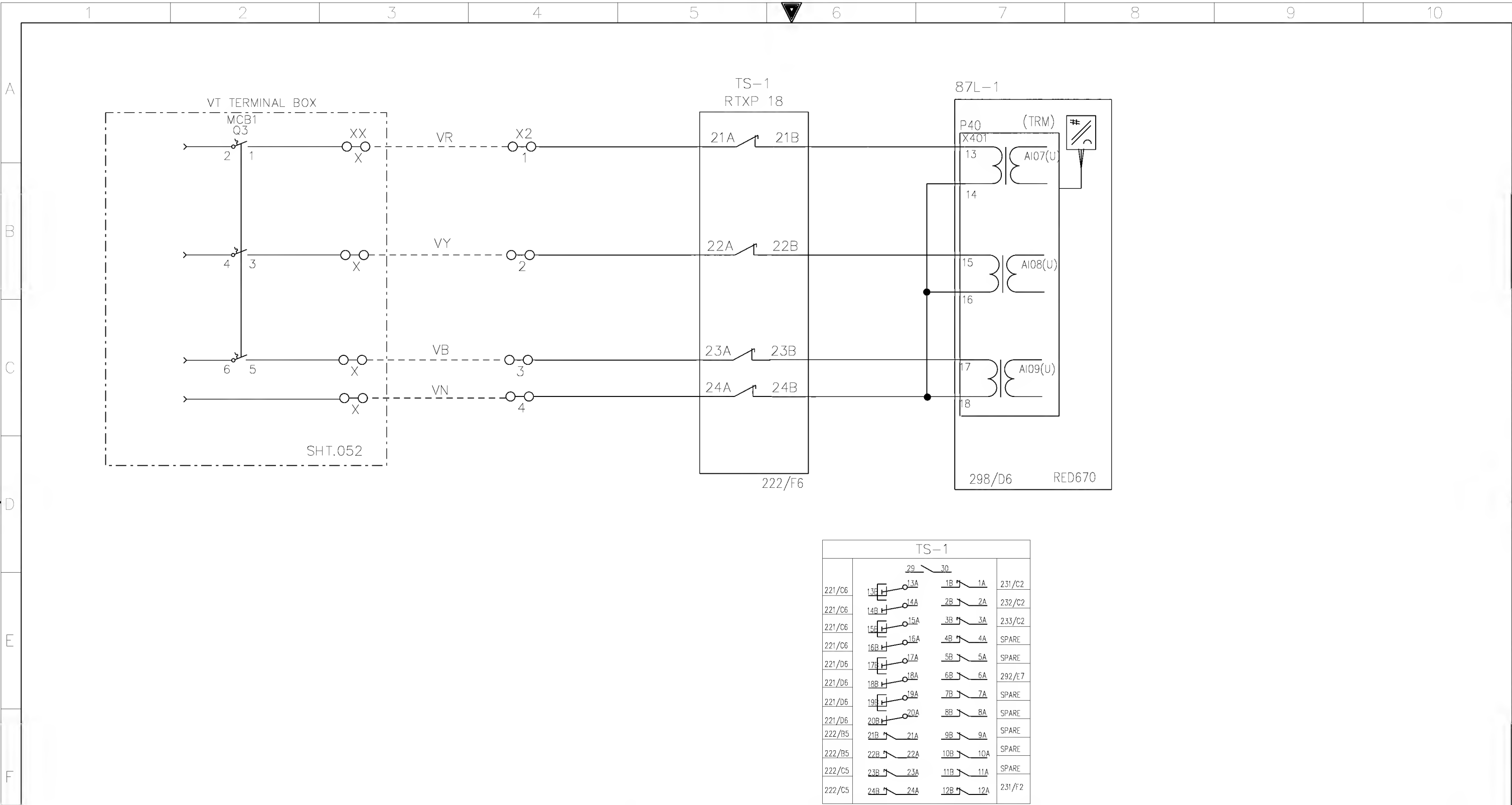


+R02.1

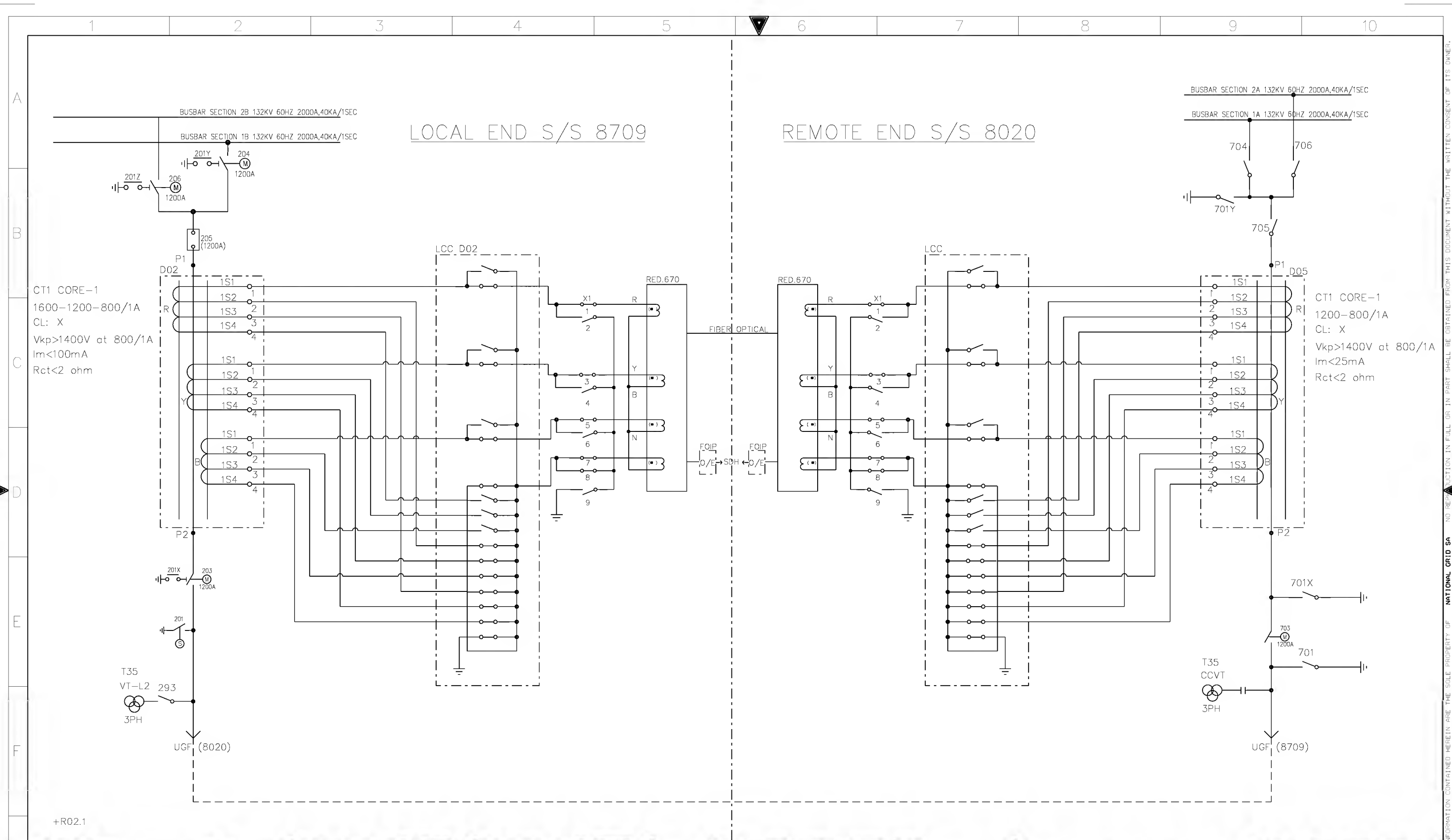
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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| | | | DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u> | | | |
| 01 | 13 49 | FACTORY ASBUILT | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | | |
| 00 | 13 04 | FOR APPROVAL | OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u> | | | |
| REV. NO. | DATE | DESCRIPTION | | | | |

CURRENT TRANSFORMER INPUTS -87L-1
132kV UGF-8020 RELAY PANEL-1 +R02.1
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

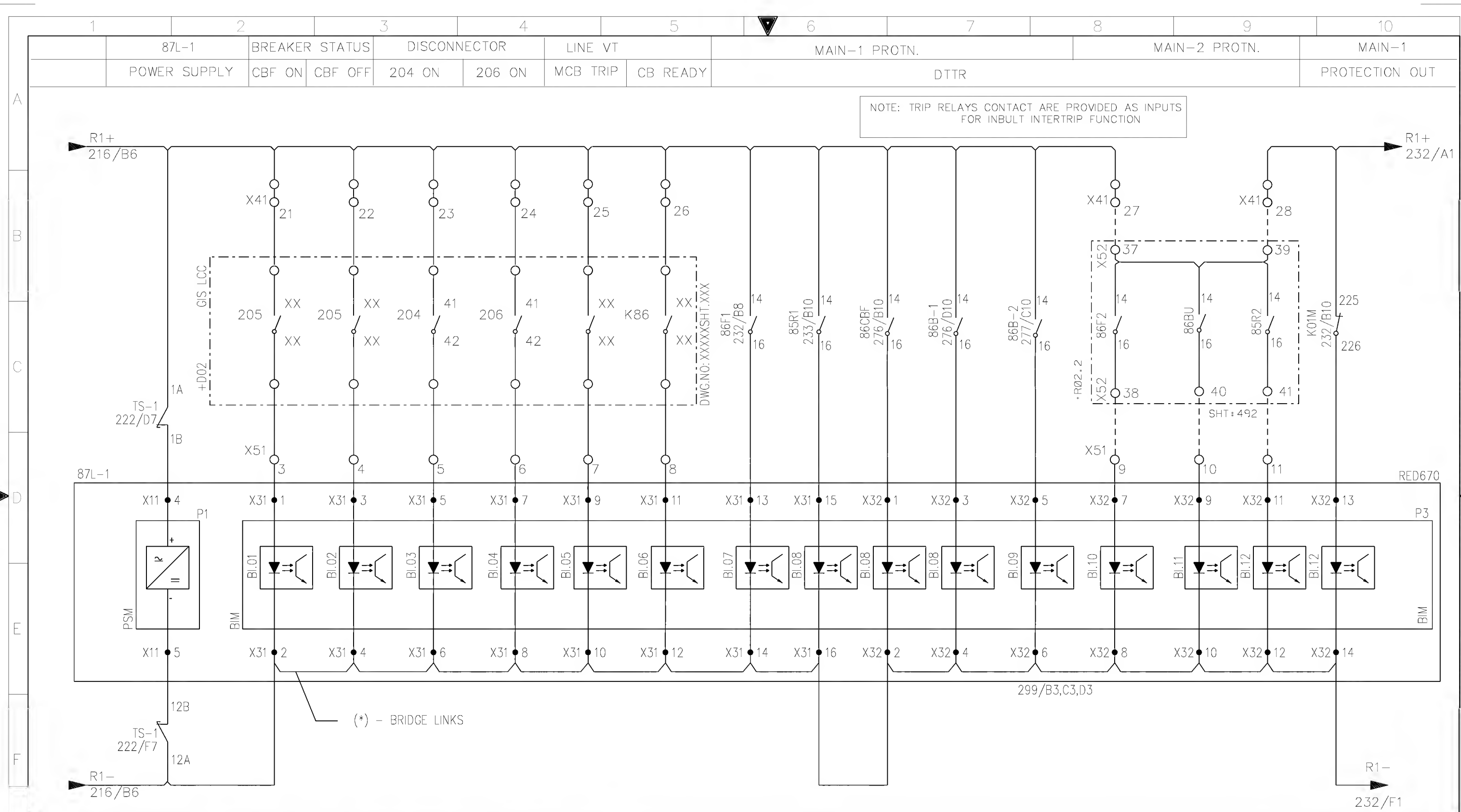
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| الشركة الوطنية لنقل الكهرباء | |  | | نقل الكهرباء | |
| | | | | National Grid sa | |
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|------------------------------|--|--|--------------------------|--|-------------------------|--|-------------------------------------|--|---|--|-------|--|-----------|--|----------------|--|-----------|--|-----------|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | VOLTAGE TRANSFORMER INPUTS -87L-1 | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div> | | | | | | | | | | | |
| | | | DRAWN BY RIZ | | CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | | | | | | | | | | | |
| 01 13 49 | | | FACTORY ASBUILT | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | INDEX | | PLANT NO. | | DRAWING NUMBER | | SHEET NO. | | REV. NO. | |
| 00 13 04 | | | FOR APPROVAL | | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | | RIYADH | | - | | C421 | | CD-322916 | | SHT 222 | | CONT. 223 | |
| REV. NO. | | | DATE | | DESCRIPTION | | | | SAUDI ARABIA | | | | | | | | | | 01 | |



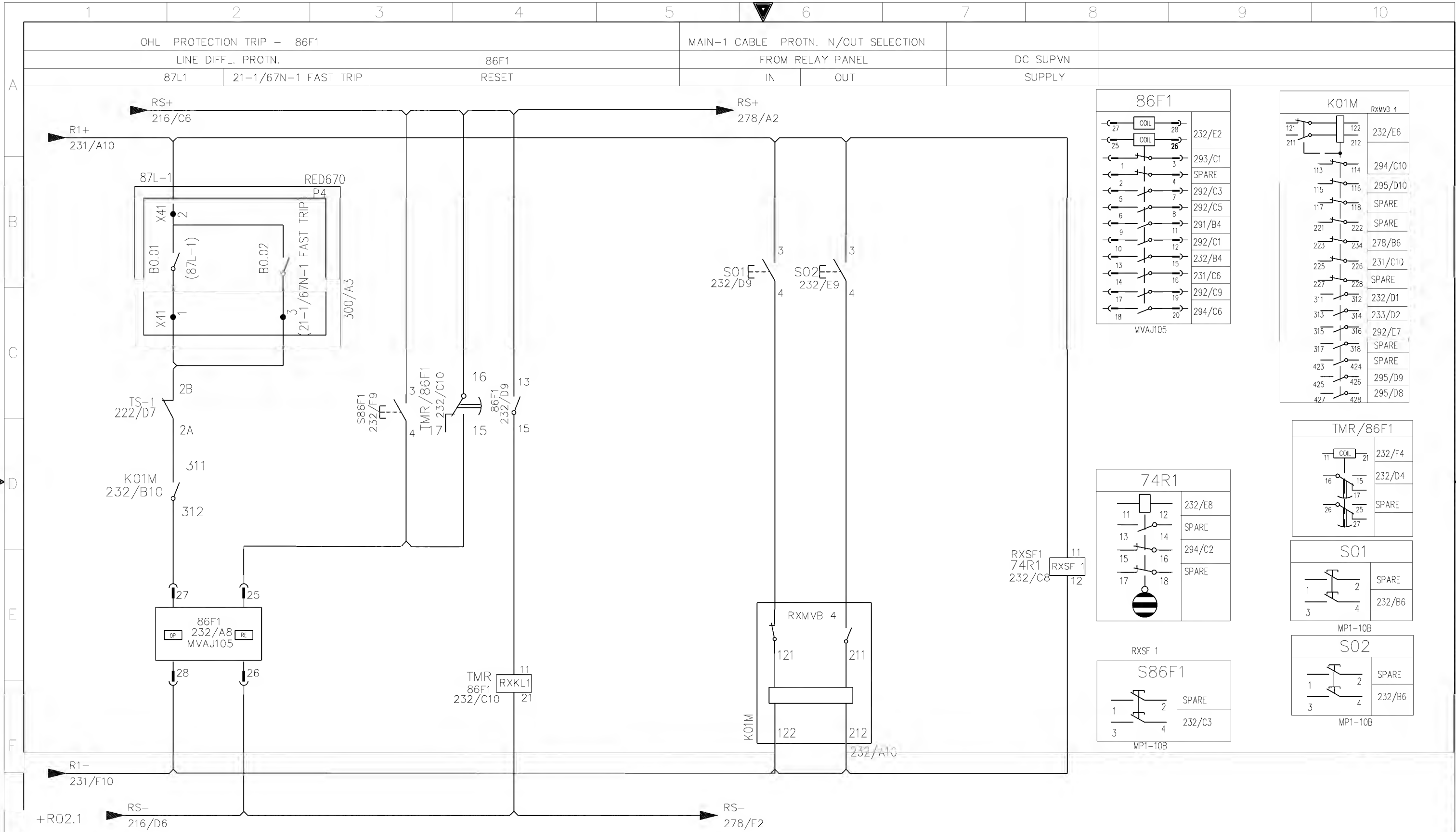
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|------------------------------|--|--|-----------------------------|--|--|--|--------------------------------------|--|--|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COMMUNICATION CIRCUITS | | <div><div></div><div>نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa</div></div> | |
| | | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | |
| 01 13 49 | | | FACTORY ASBUILT | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO. | |
| 00 13 04 | | | FOR APPROVAL | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | - C421 CD-322916 | |
| REV. NO. DATE DESCRIPTION | | | | | | | | | SHT CONT. 01 | |
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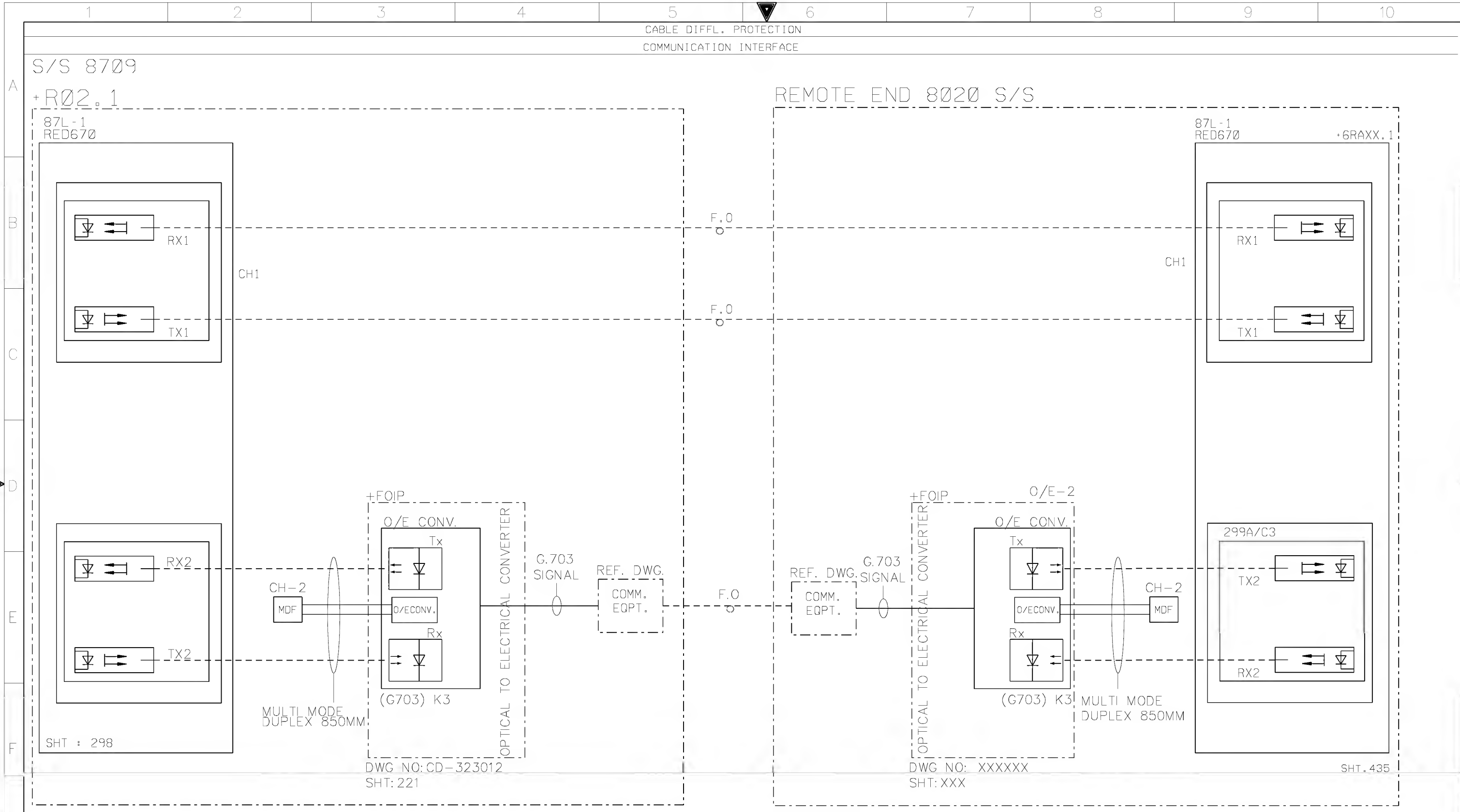
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|------------------------------|-------|--------------------------|--|--|--|---|--|---|-----------|----------------|--|-----------|--|----------|
| AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | MAIN-1 PROTN. 87L-1 RELAY-BINARY INPUTS | | <div>نقل الكهرباء</div> <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div> | | | | | | |
| 01 | 13 49 | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | | | | | | |
| 00 | 13 04 | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| REV. NO. | DATE | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | - | C421 | CD-322916 | | SHT CONT. | | 01 |
| | | | | | | | | | | | | 231 232 | | |

NG/D2-D (2012/01)

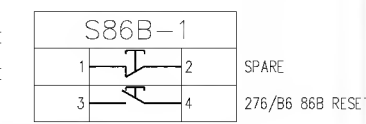
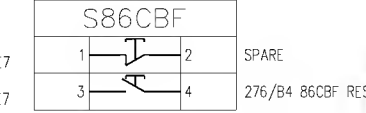
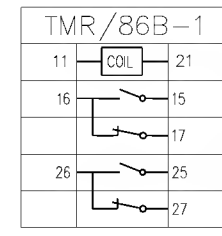
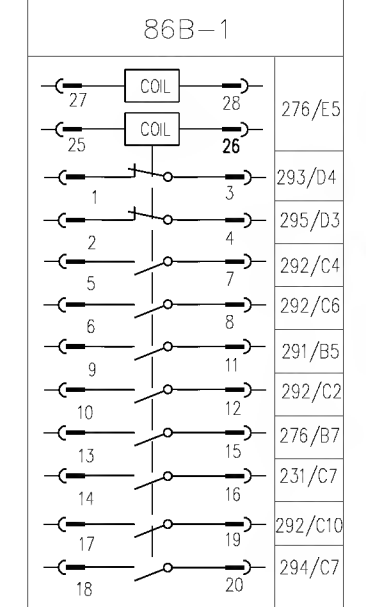
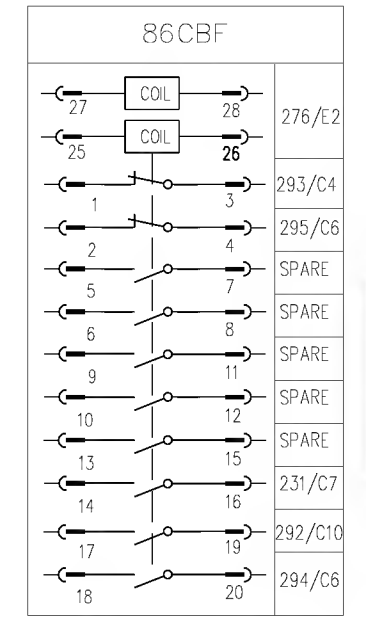
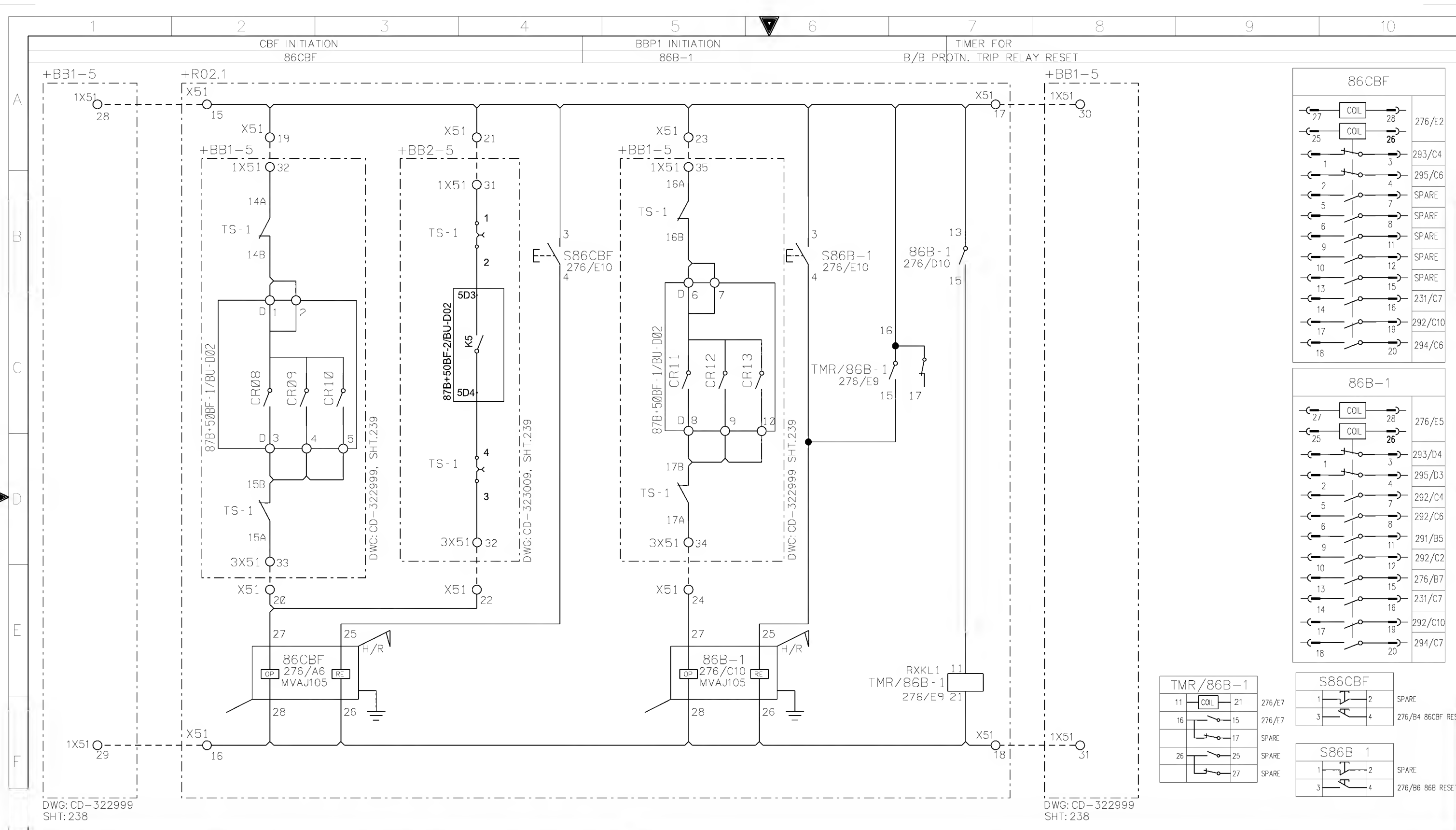
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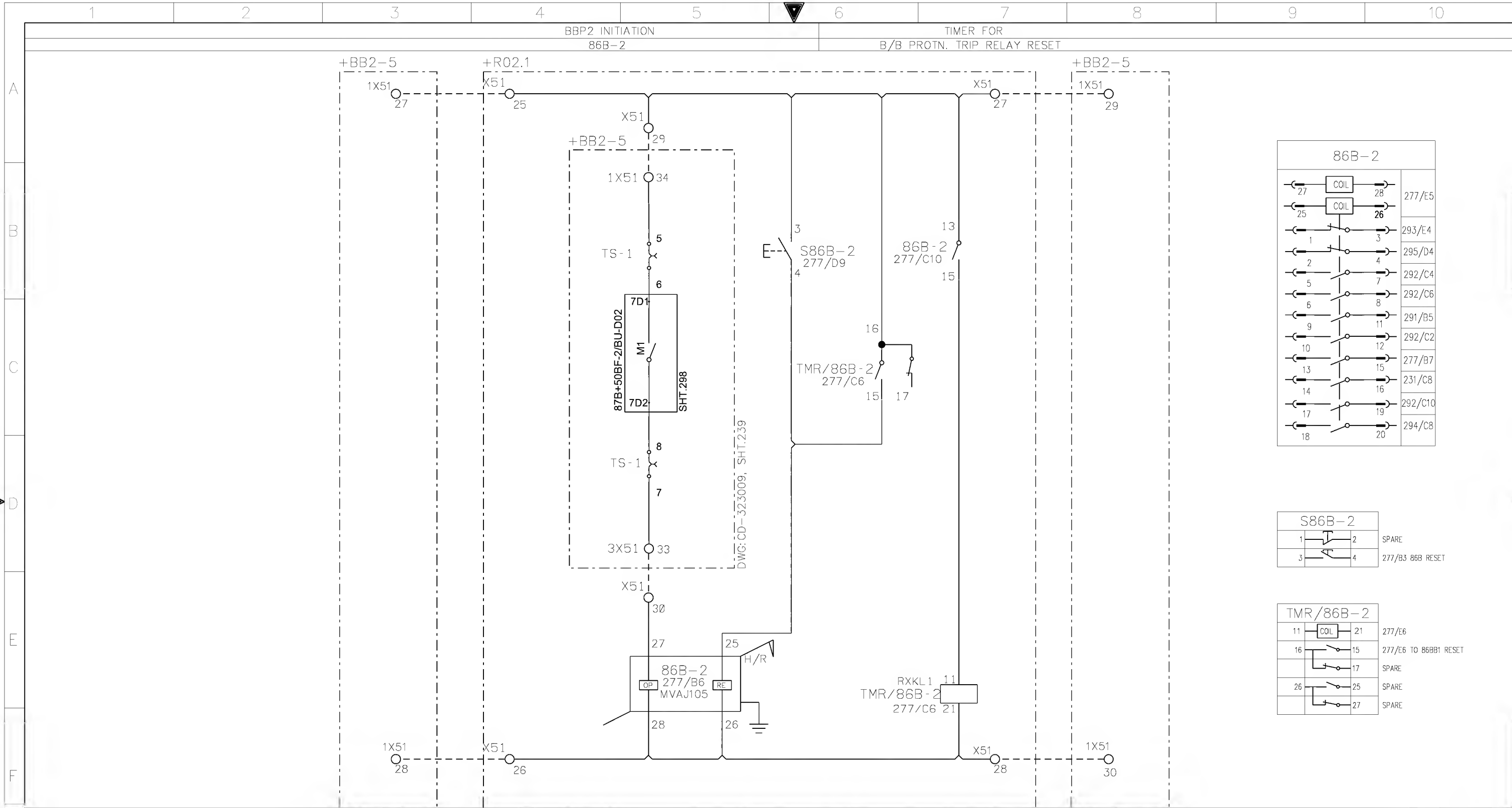
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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | MAIN-1 CABLE DIFF. PROTECTION TRIP RELAY CKT. | | | <div>نقل الكهرباء</div> <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid SA</div> | | | | | | | |
| G | 01 | 13 49 | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | INDEX | | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| | 00 | 13 04 | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | - | | C421 | CD-322916 | | SHT | | CONT. |
| | REV. NO. | DATE | DESCRIPTION | | OPRG. DEPT. CTFD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | | | | | | | 232 | 233 | 01 |



| | | | | | | | | | | | |
|------------------------------|--|--|--------------------------|--|-----------------------|--|--------------------------------------|--|---|-------------------|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COMMUNICATION INTERFACE | | الشركة الوطنية لنقل الكهرباء National Grid sa | | |
| 01 13 49 FACTORY ASBUILT | | | DRAWN BY RIZ | | CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | | |
| 00 13 04 FOR APPROVAL | | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | INDEX PLANT NO. DRAWING NUMBER SHEET NO. CONT. REV. NO. | | |
| REV. NO. DATE DESCRIPTION | | | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | - C421 CD-322916 246 276 01 | | |
| | | | | | | | | | | NG/D2-D (2012/01) | |
| | | | | | | | | | | DMS VECTOR NGD200 | |



| | | | | | | | | | | |
|------------------------------|--|--|--------------------------|--|-----------------------|--|---|--|--|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | CBF-1/2 & BUSBAR PROTN-1 TRIP RELAY CIRCUIT | | <div>نقل الكهرباء</div> <div>الشركة الوطنية لنقل الكهرباء</div> <div></div> <div>National Grid SA</div> | |
| 01 13 49 FACTORY ASBUILT | | | DRAWN BY RIZ | | CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | |
| 00 13 04 FOR APPROVAL | | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | |
| REV. NO. DATE DESCRIPTION | | | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO. | |
| | | | | | | | | | - C421 CD-322916 276 277 01 | |

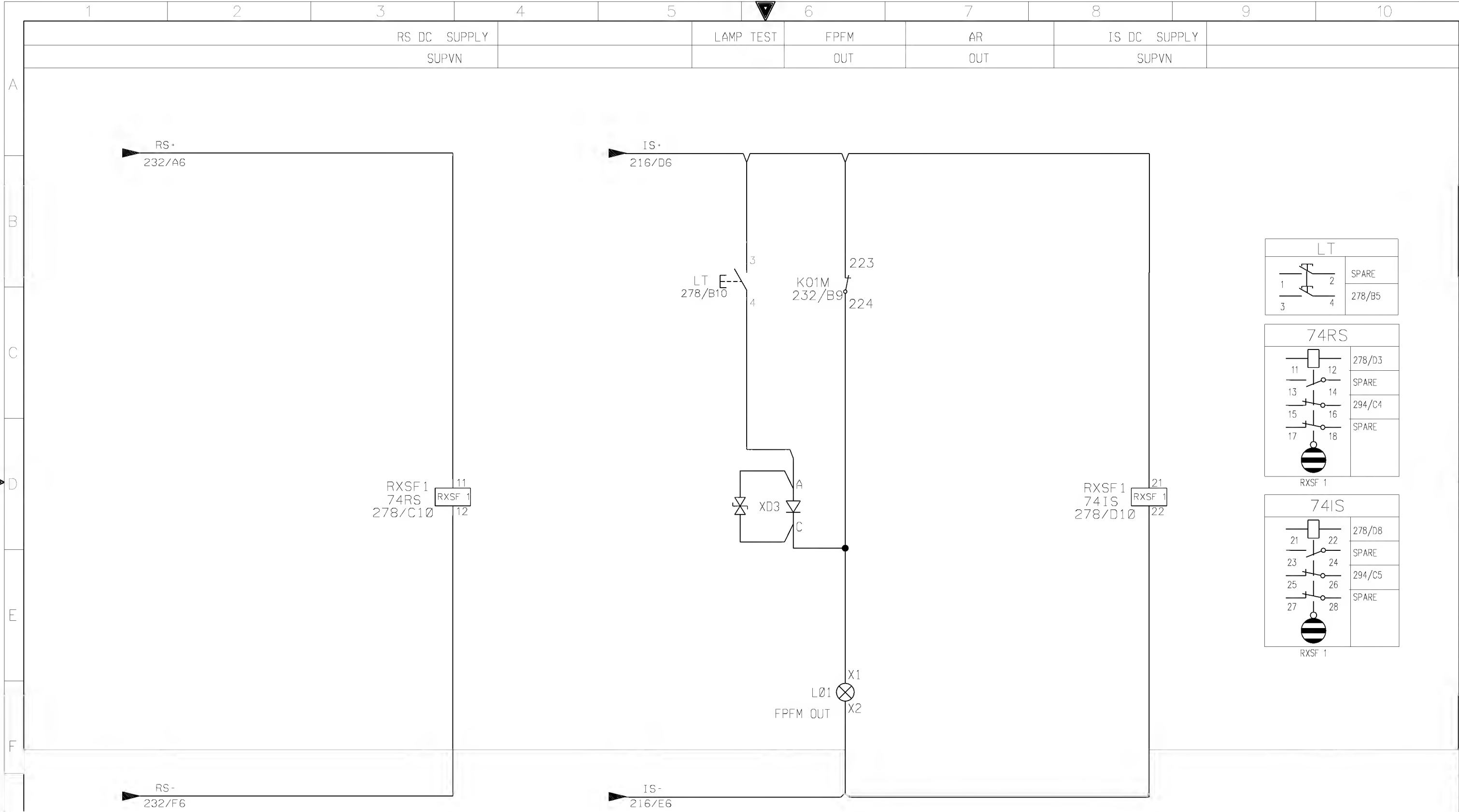


| 86B-2 | | | |
|-------|------|----|---------|
| 27 | COIL | 28 | 277/E5 |
| 25 | COIL | 26 | |
| 1 | | 3 | 293/E4 |
| 2 | | 4 | 295/D4 |
| 5 | | 7 | 292/C4 |
| 6 | | 8 | 292/C6 |
| 9 | | 11 | 291/B5 |
| 10 | | 12 | 292/C2 |
| 13 | | 15 | 277/B7 |
| 14 | | 16 | 231/C8 |
| 17 | | 19 | 292/C10 |
| 18 | | 20 | 294/C8 |

| S86B-2 | | | |
|--------|--|---|------------------|
| 1 | | 2 | SPARE |
| 3 | | 4 | 277/B3 86B RESET |

| TMR/86B-2 | | | |
|-----------|------|----|-----------------------|
| 11 | COIL | 21 | 277/E6 |
| 16 | | 15 | 277/E6 TO 86BB1 RESET |
| | | 17 | SPARE |
| 26 | | 25 | SPARE |
| | | 27 | SPARE |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|--|--|--------------------------|--|-----------------------|--|-----------------------------------|--|-------------------------------------|--|--------------------------------------|--|---------------------|--|--|--|----------------------|--|--------------------------|--|-----------------------------|--|-------------|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | BUSBAR PROTN-2 TRIP RELAY CIRCUIT | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | RIYADH SAUDI ARABIA | | الشركة الوطنية لنقل الكهرباء National Grid sa | | INDEX PLANT NO. C421 | | DRAWING NUMBER CD-322916 | | SHEET NO. SHT 277 CONT. 278 | | REV. NO. 01 | |
| 01 13 49 FACTORY ASBUILT | | | DRAWN BY RIZ | | CHECKED BY KVR | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | | | | | | | | | | | | | | |
| 00 13 04 FOR APPROVAL | | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | | | | | | | | | | | | | | | |
| REV. NO. DATE DESCRIPTION | | | | | | | | | | | | | | | | | | | | | | | | |

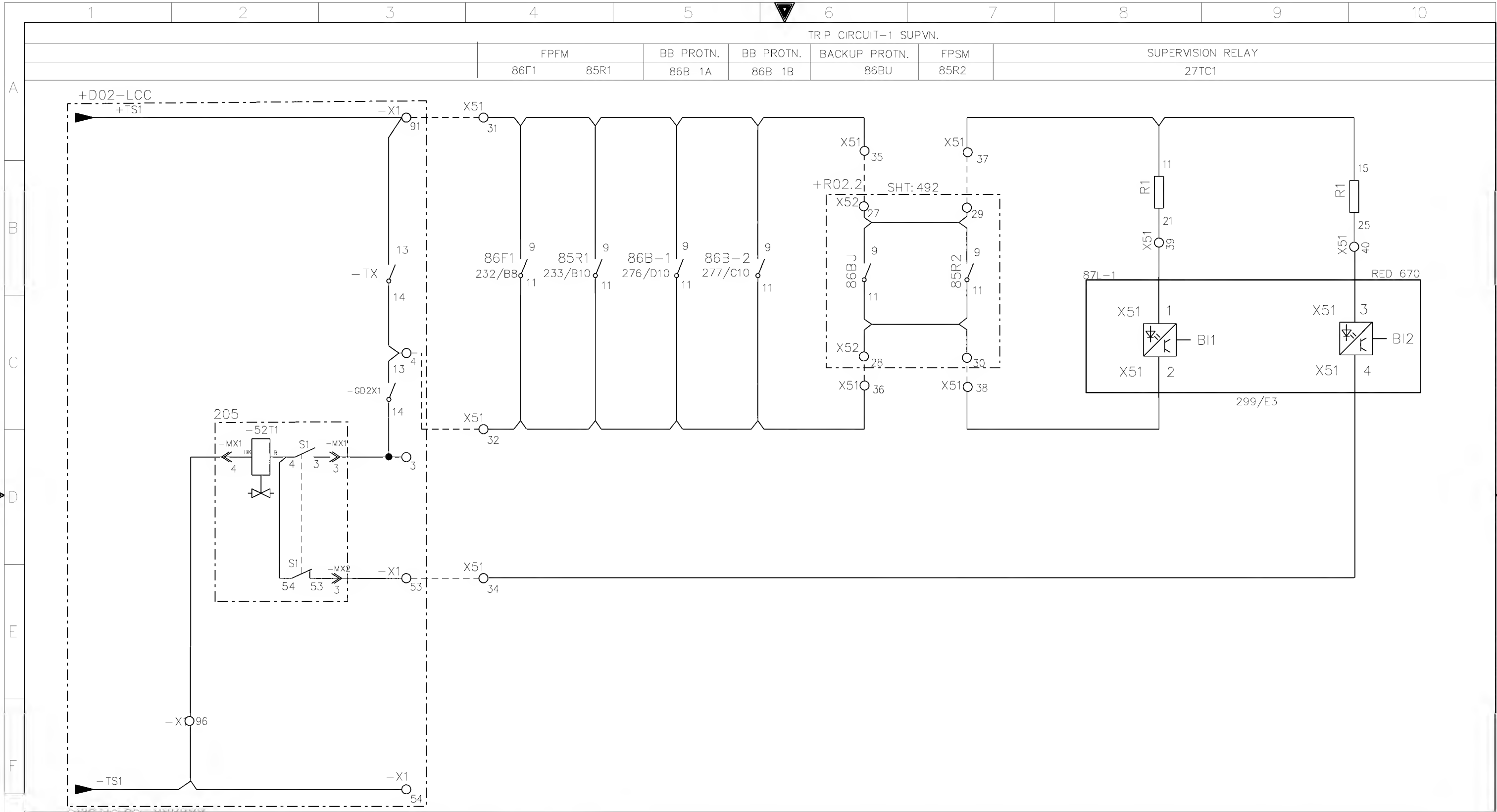


AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | | | |
|----------|-------|-----------------|-------------------------|---------------------|
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

BUSBAR PROTN-2 TRIP RELAY CIRCUIT
132kV UGF-8020 RELAY PANEL-1 +R02.1
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

| | | | | |
|--|-----------|----------------|-----------|-----------|
| الشركة الوطنية لنقل الكهرباء National Grid sa | | | | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| - | C421 | CD-322916 | SHT 278 | CONT. 291 |
| | | | 01 | |



DWG. NO. CD=XXXXXX
SHT. XX

+R02.1

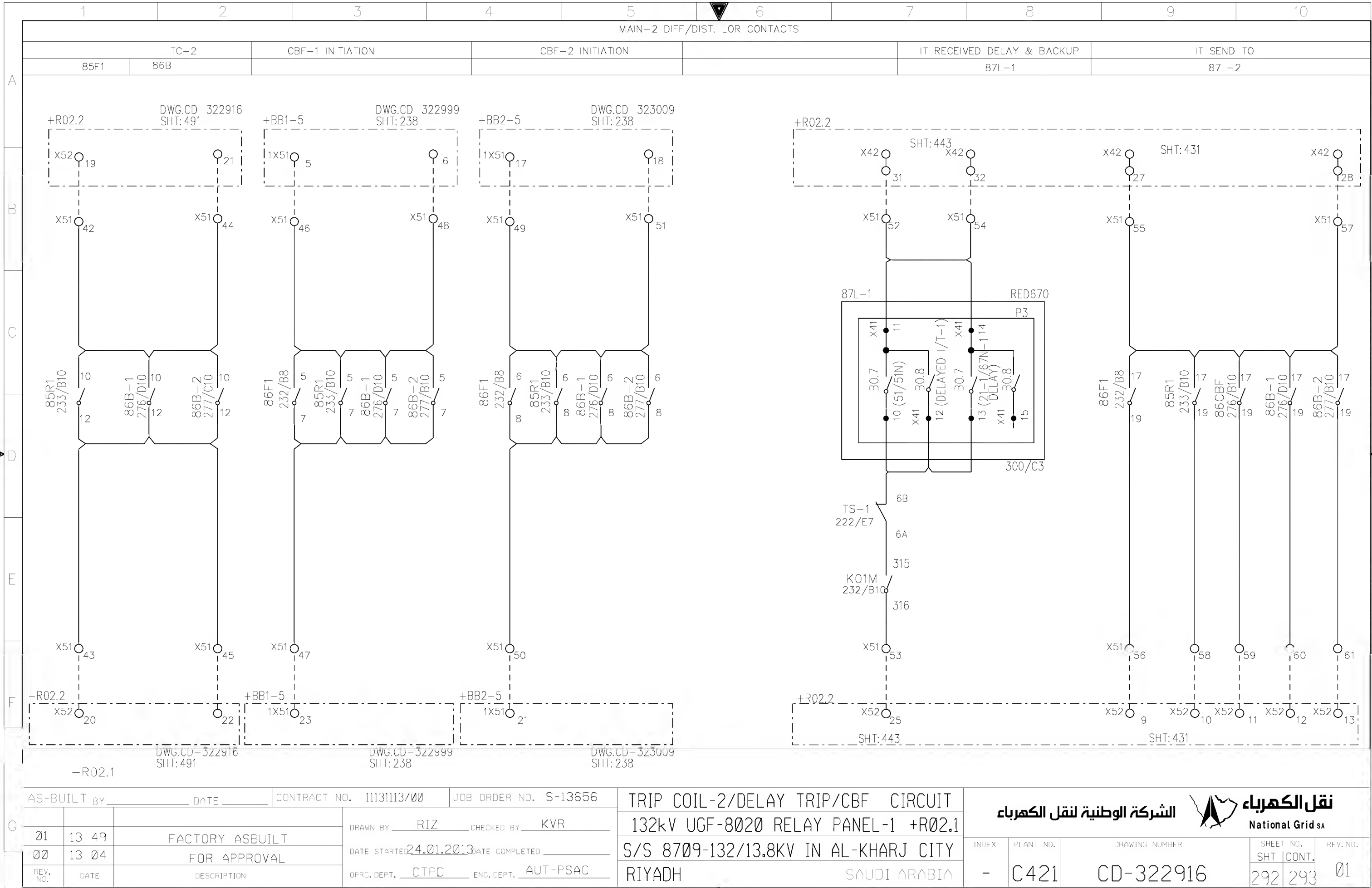
AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | | | |
|----------|-------|-----------------|-------------------------|---------------------|
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

TRIP COIL-1 SUPERVISION CIRCUIT
132kV UGF-8020 RELAY PANEL-1 +R02.1
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
National Grid sa

| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
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| - | C421 | CD-322916 | 291 | 01 |

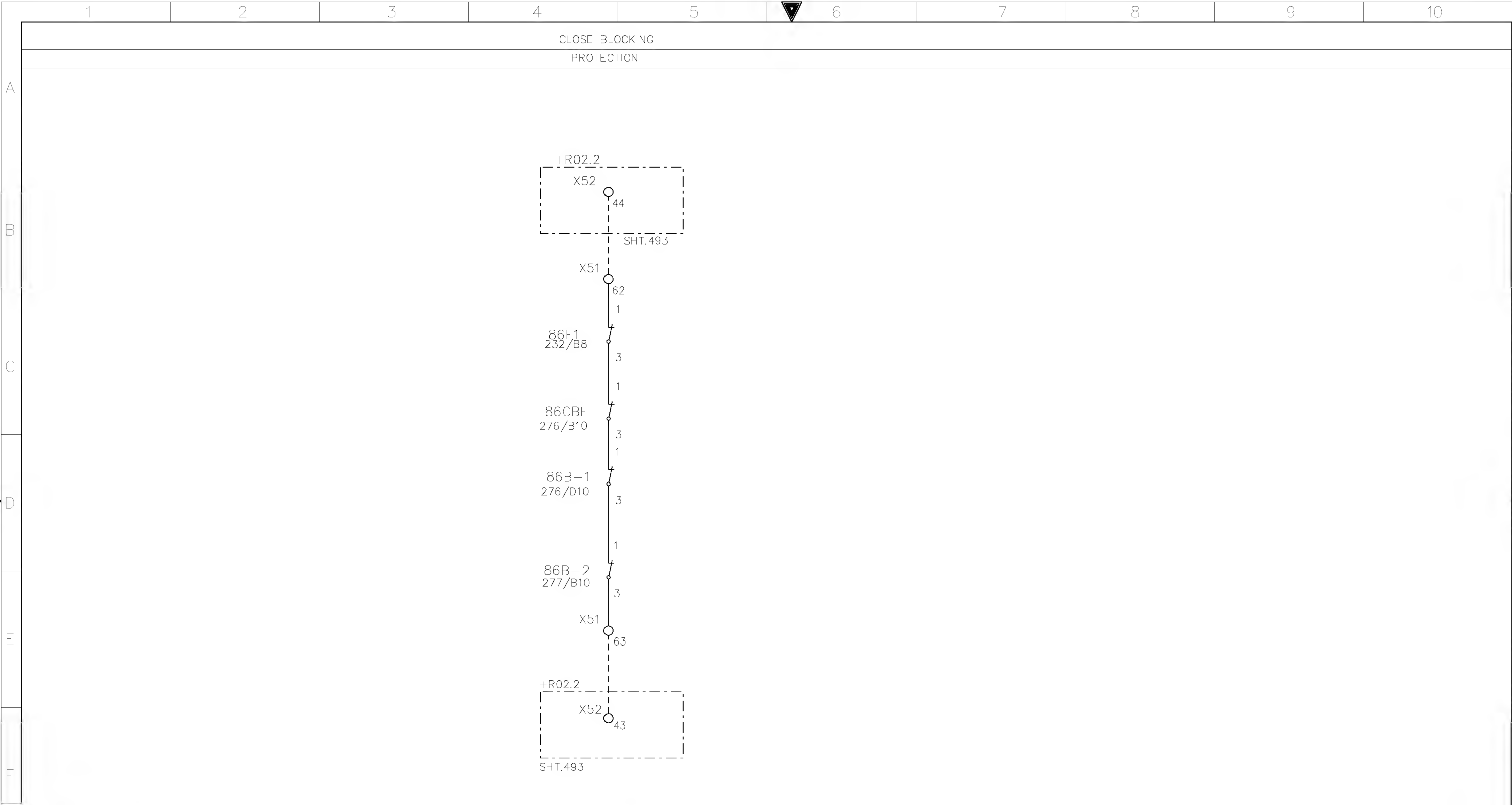


AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

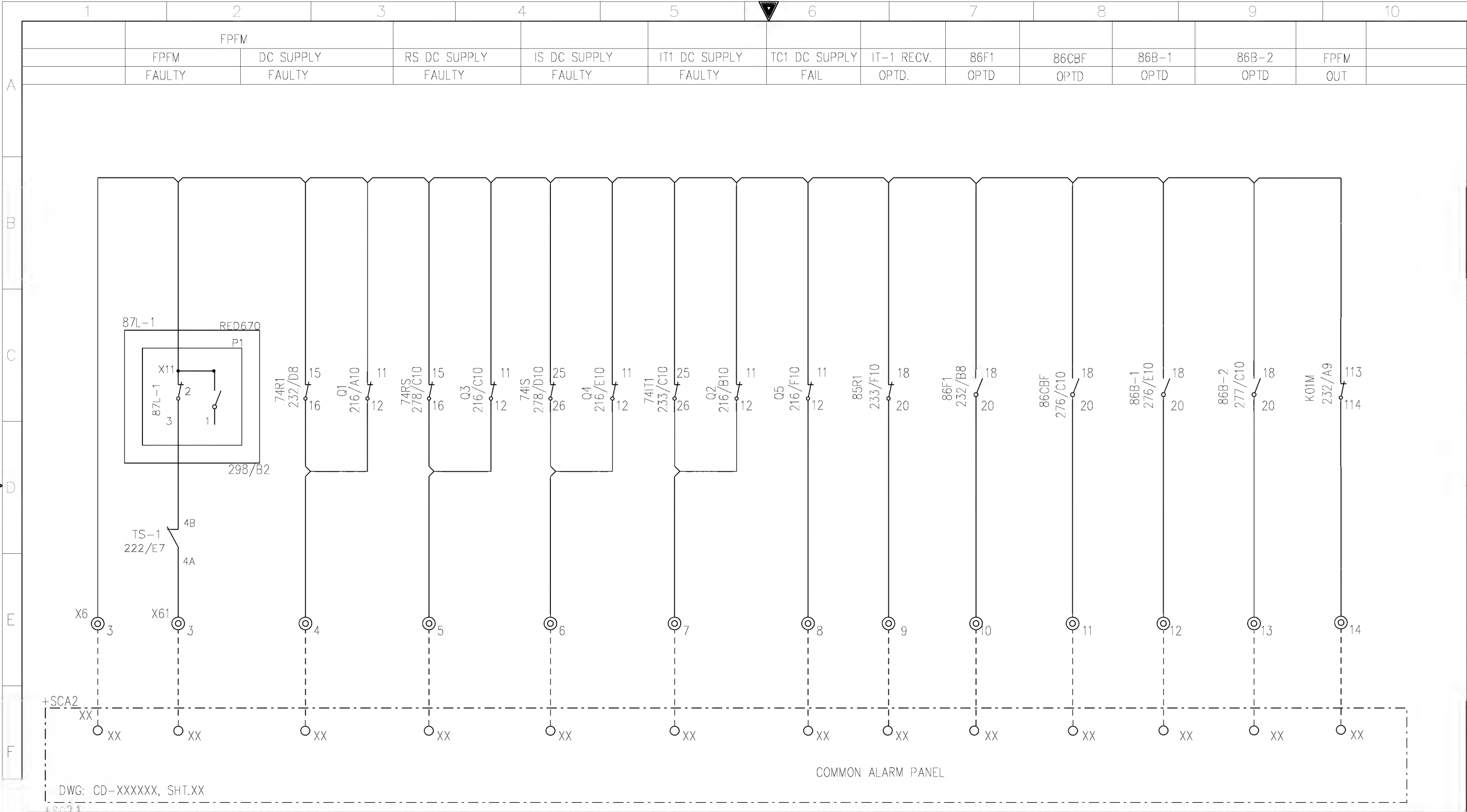
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| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

TRIP COIL-2/DELAY TRIP/CBF CIRCUIT
132kV UGF-8020 RELAY PANEL-1 +R02.1
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

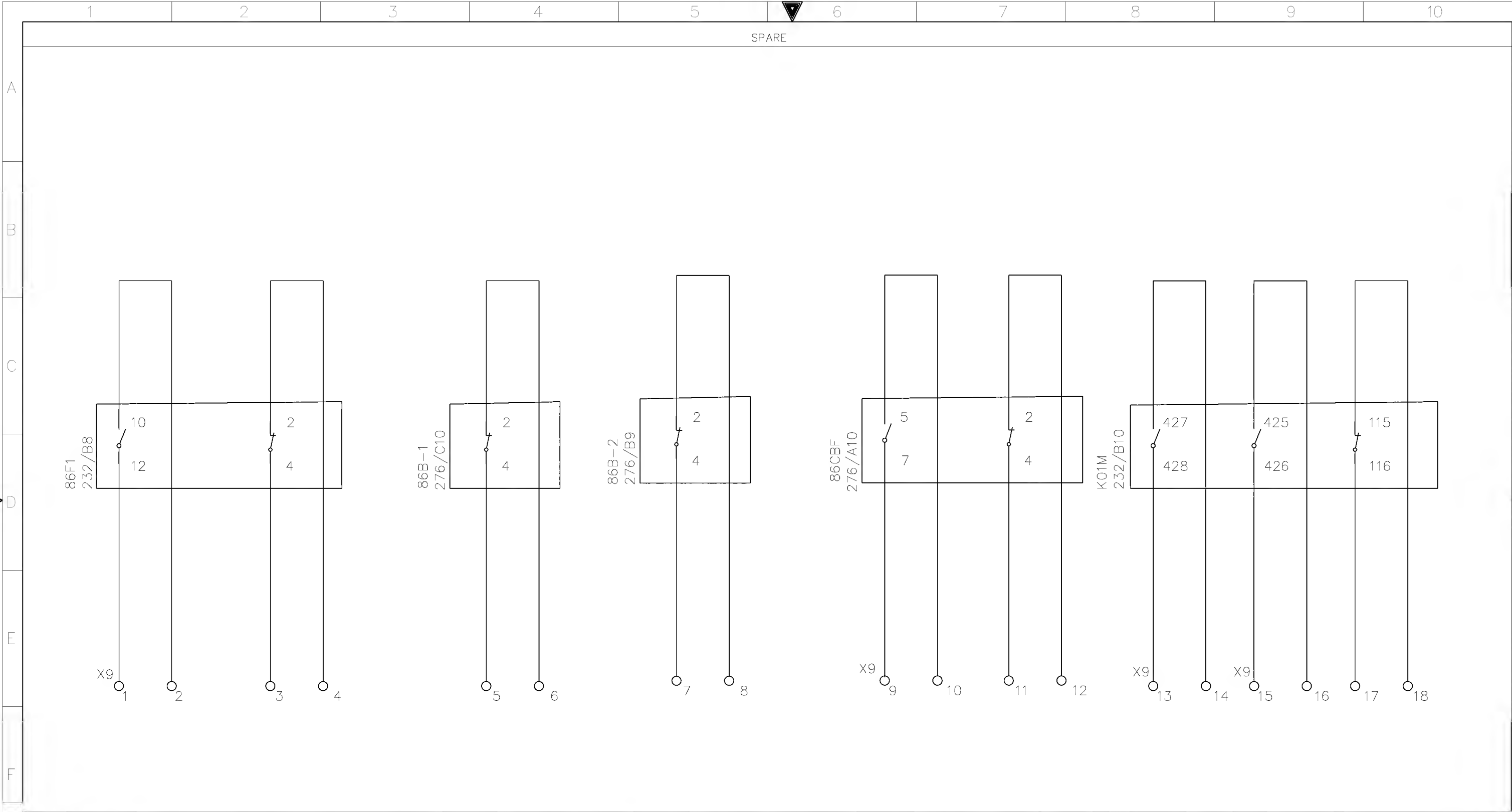
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| الشركة الوطنية لنقل الكهرباء | | National Grid sa | | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
| - | C421 | CD-322916 | 292 | 01 |



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|------------------------------|--|--|---|--|---|--|---------------------|--------------------------------------|--|---|--|-----------|--|----------------|--|-----------|--|----------|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | CLOSE BLOCK CIRCUIT | | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div> | | | | | | | | | |
| | | | DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u> | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | | | INDEX | | PLANT NO. | | DRAWING NUMBER | | SHEET NO. | | REV. NO. | |
| 01 13 49 | | | FACTORY ASBUILT | | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | | | | SHT | | CONT. | |
| 00 13 04 | | | FOR APPROVAL | | OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u> | | | RIYADH SAUDI ARABIA | | | | C421 | | CD-322916 | | 293 | | 294 | |
| REV. NO. DATE DESCRIPTION | | | | | | | | | | | | | | | | | | 01 | |



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|---|------------------------------|-------|---------------------------------|--------------------------------------|--|---------------------|--------------------------------------|-------|---|----------------|-------------------|-----------|----|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COMMON ALARM CIRCUITS | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div> | | | | |
| | 01 | 13 49 | FACTORY ASBUILT FOR APPROVAL | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | | | | |
| | 00 | 13 04 | | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | | |
| | REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | |
| | | | | | | | - | C421 | CD-322916 | | SHT 294 CONT. 295 | | 01 |

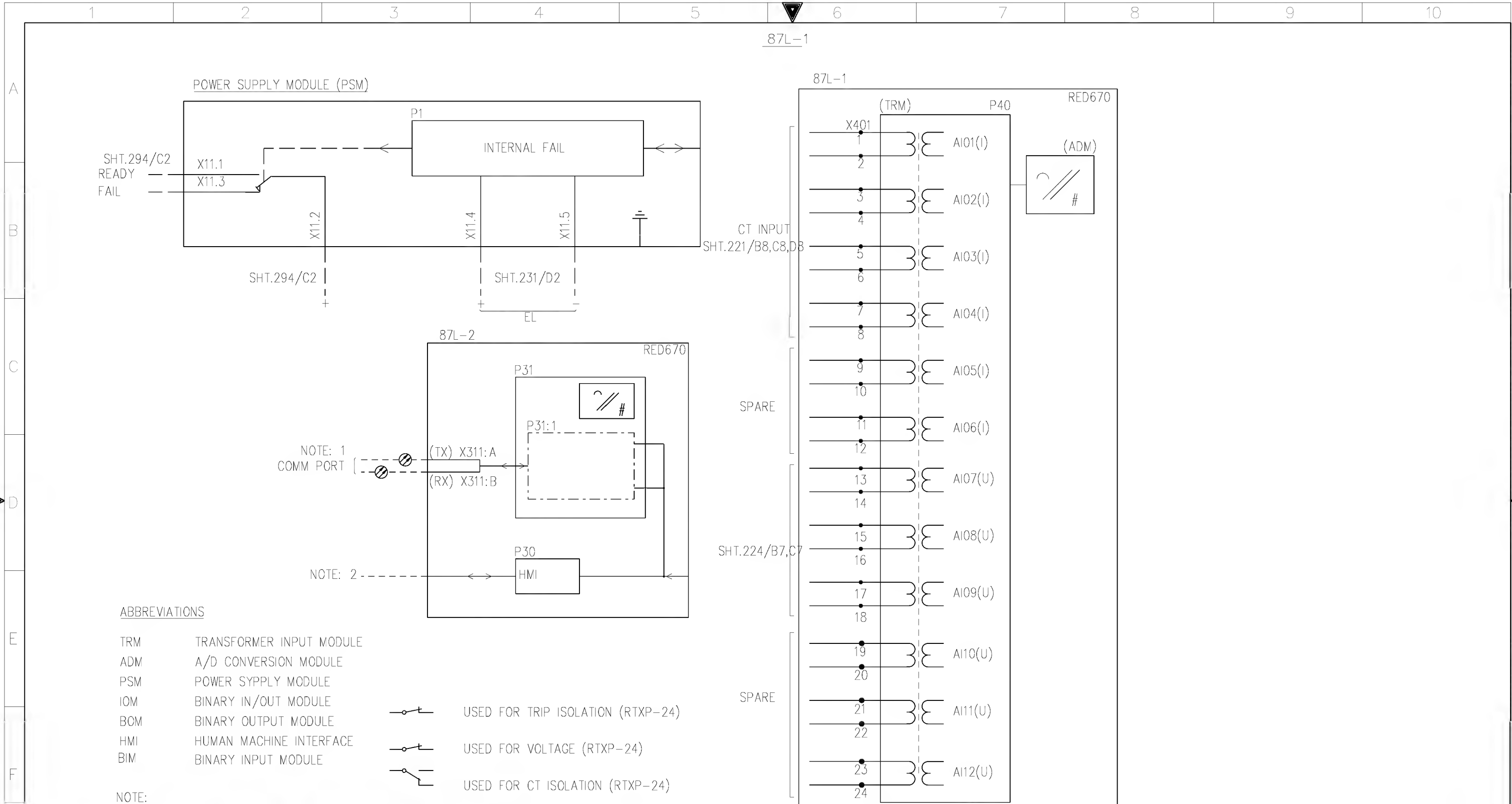



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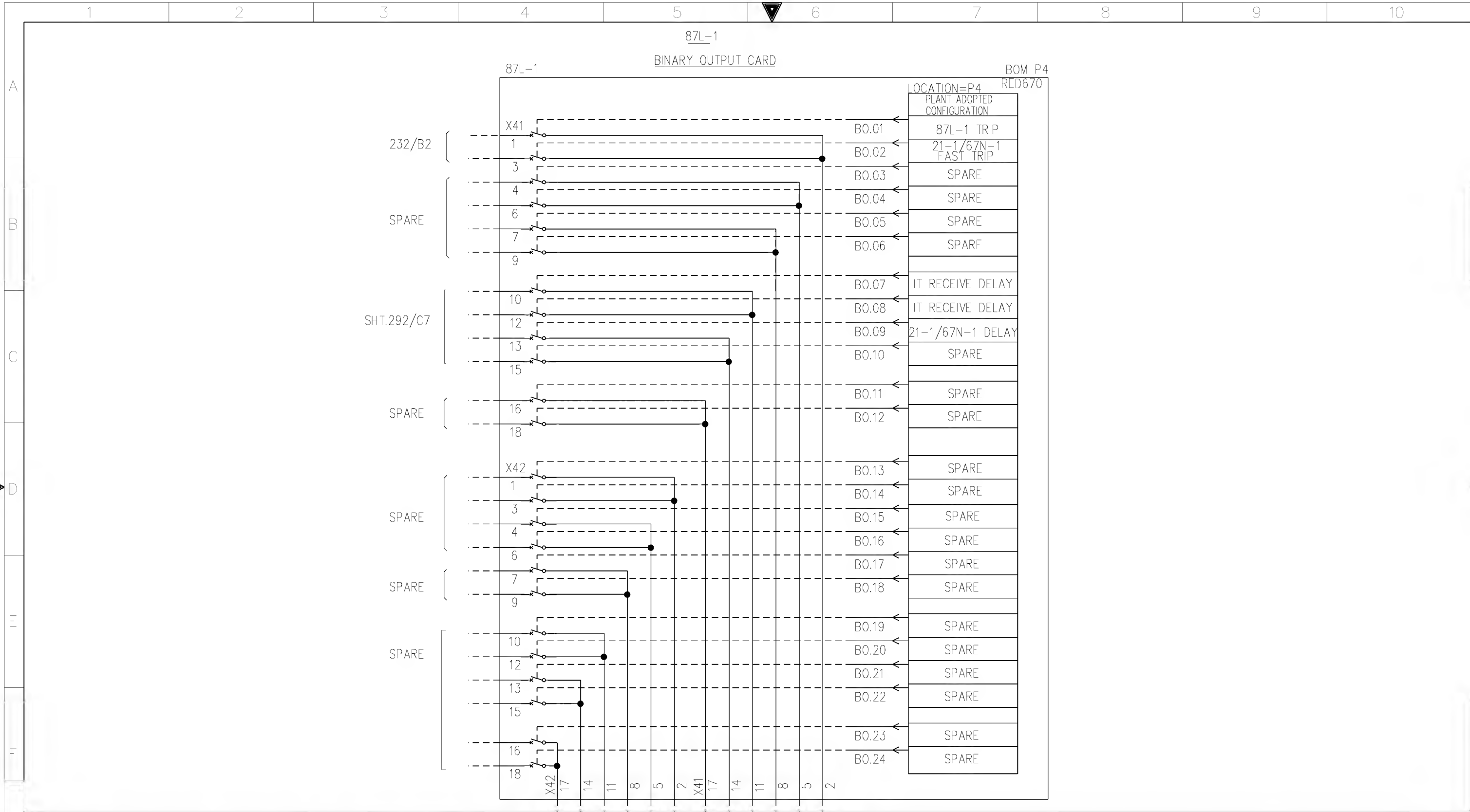
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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| 01 | 13 49 | FACTORY ASBUILT FOR APPROVAL | DRAWN BY RIZ | | CHECKED BY KVR | |
| 00 | 13 04 | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | |

| | |
|--------------------------------------|--|
| SPARE CONTACTS | |
| 132kV UGF-8020 RELAY PANEL-1 +R02.1 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH SAUDI ARABIA | |

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| الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | | National Grid sa | | | |
| INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | | |
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| | | | | REV. NO. 01 | | | |



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|------------------------------|--|--|---|--|---|--|--------------------------------------|--|--|--|------|-----------|----------------|-----------|-------|----------|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | BLOCK REFERENCE | | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div> | | | | | | |
| | | | DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u> | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | INDEX | | | | | PLANT NO. | DRAWING NUMBER | SHEET NO. | | REV. NO. |
| 01 13 49 | | | FACTORY ASBUILT | | DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | - | C421 | CD-322916 | SHT | | CONT. | 01 |
| 00 13 04 | | | FOR APPROVAL | | OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u> | | RIYADH | | | | | | 298 | 299 | | |
| REV. NO. | | | DATE | | DESCRIPTION | | | | | | | | | | | |



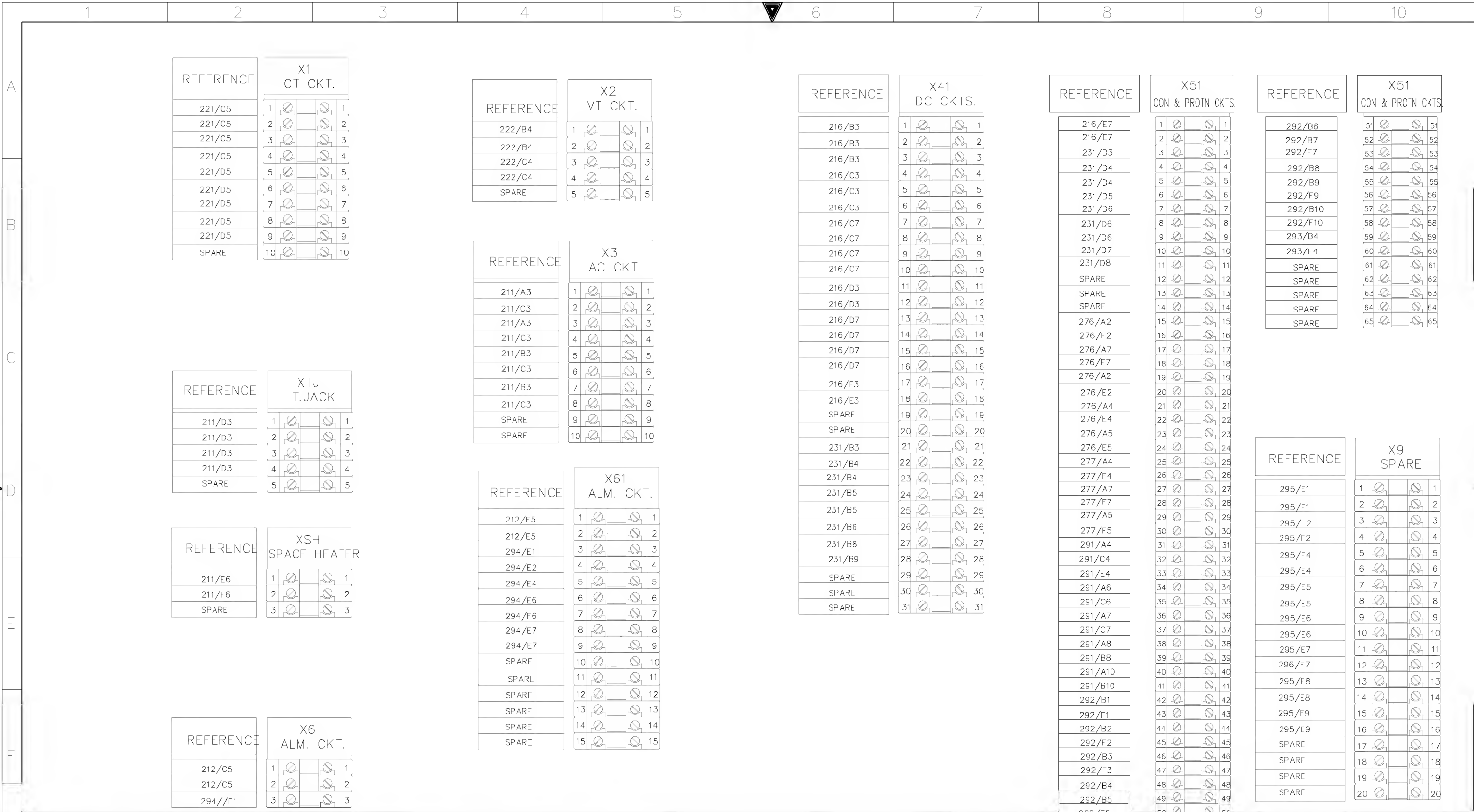
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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 1113/113/00 | | JOB ORDER NO. S-13656 | | BLOCK REFERENCE | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div> | | | | | | | |
| | | | DRAWN BY RIZ | | CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | | | | | | | |
| 01 | 13 49 | FACTORY ASBUILT | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| 00 | 13 04 | FOR APPROVAL | | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | - | C421 | CD-322916 | | SHT 300 | CONT. 301 | 01 |
| REV. NO. | DATE | DESCRIPTION | | | | | | | | | | | | | | |


NG/D2-D (2012/01)

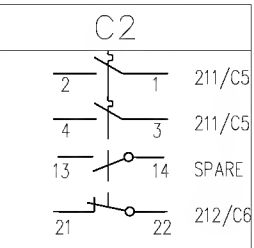
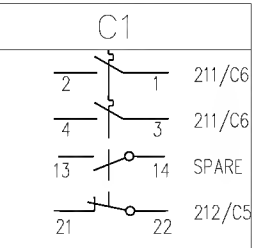
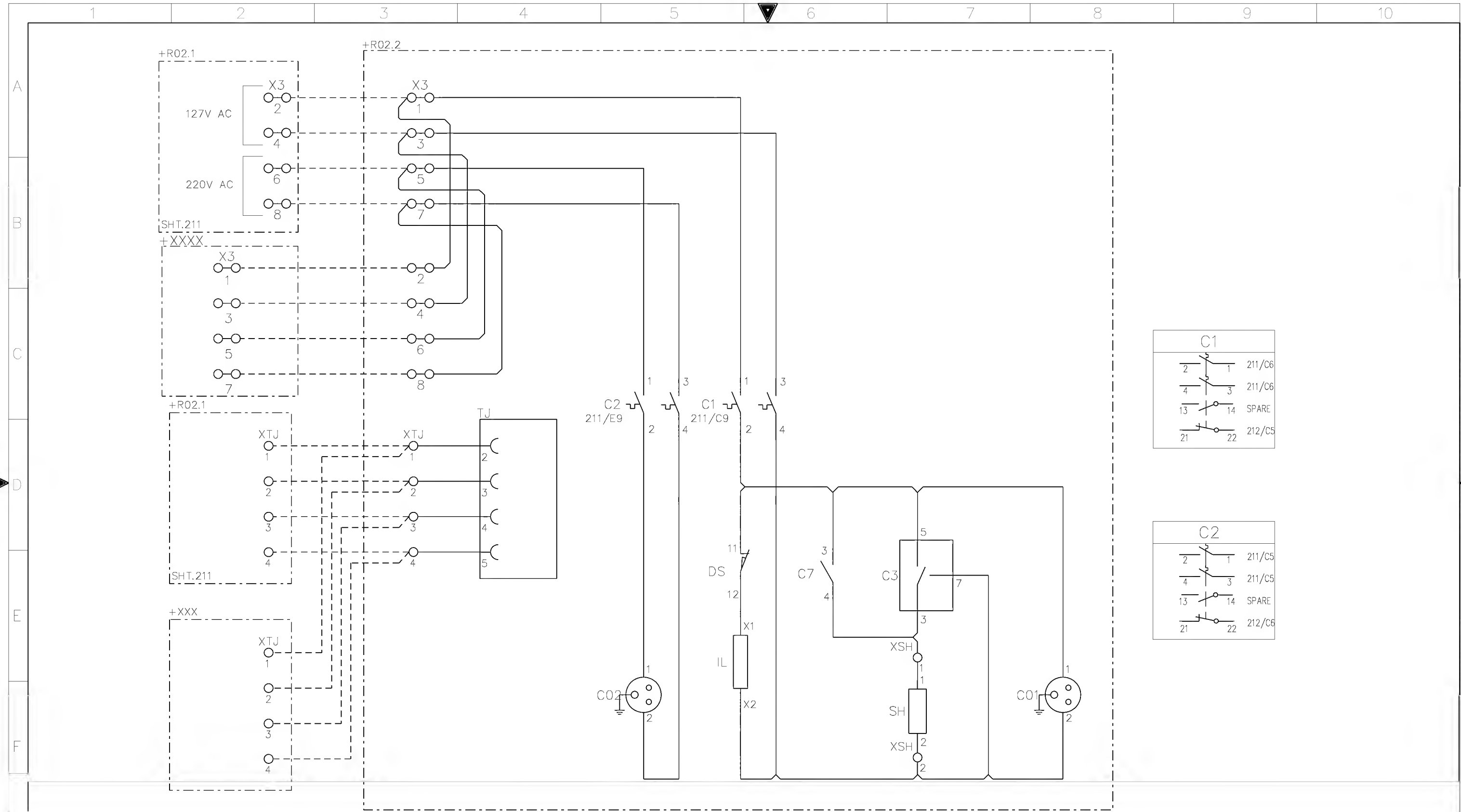
DMS

VECTOR

NGD200



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| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | TERMINAL BLOCKS PANEL +R01.1 | | | <div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء</div> <div>National Grid sa</div> | | | | | | |
| | | | | | DRAWN BY _____ RIZ _____ CHECKED BY _____ KVR | | 132kV UGF-8020 RELAY PANEL-1 +R02.1 | | | | | | | | | |
| 01 13 49 | | | FACTORY ASBUILT | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| 00 13 04 | | | FOR APPROVAL | | OPRG. DEPT. _____ CTFD _____ ENG. DEPT. _____ AUT-PSAC | | RIYADH | | | | | | | SAUDI ARABIA | | |
| REV. NO. | DATE | DESCRIPTION | | | | | | | | | | | | | | |

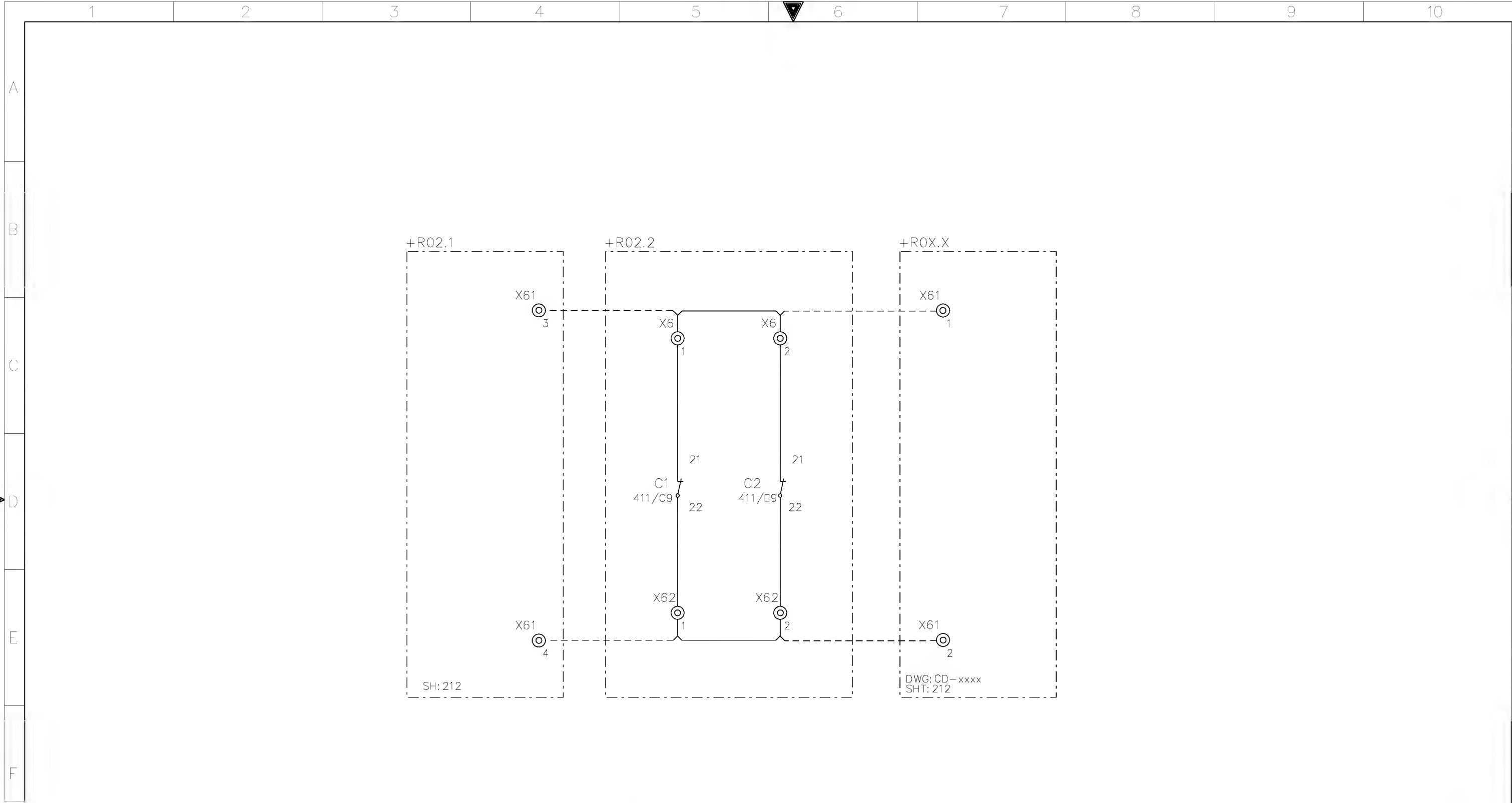


AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | | | |
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| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

AC SUPPLY FOR ILLUMINATION & POWER SOCKET
132kV UGF-8020 RELAY PANEL-1/2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

| | | | | | |
|------------------------------|-----------|----------------|-----------|------------------|----|
| الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | | National Grid sa | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. | |
| - | C421 | CD-322916 | SHT 411 | CONT. 412 | 01 |



AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

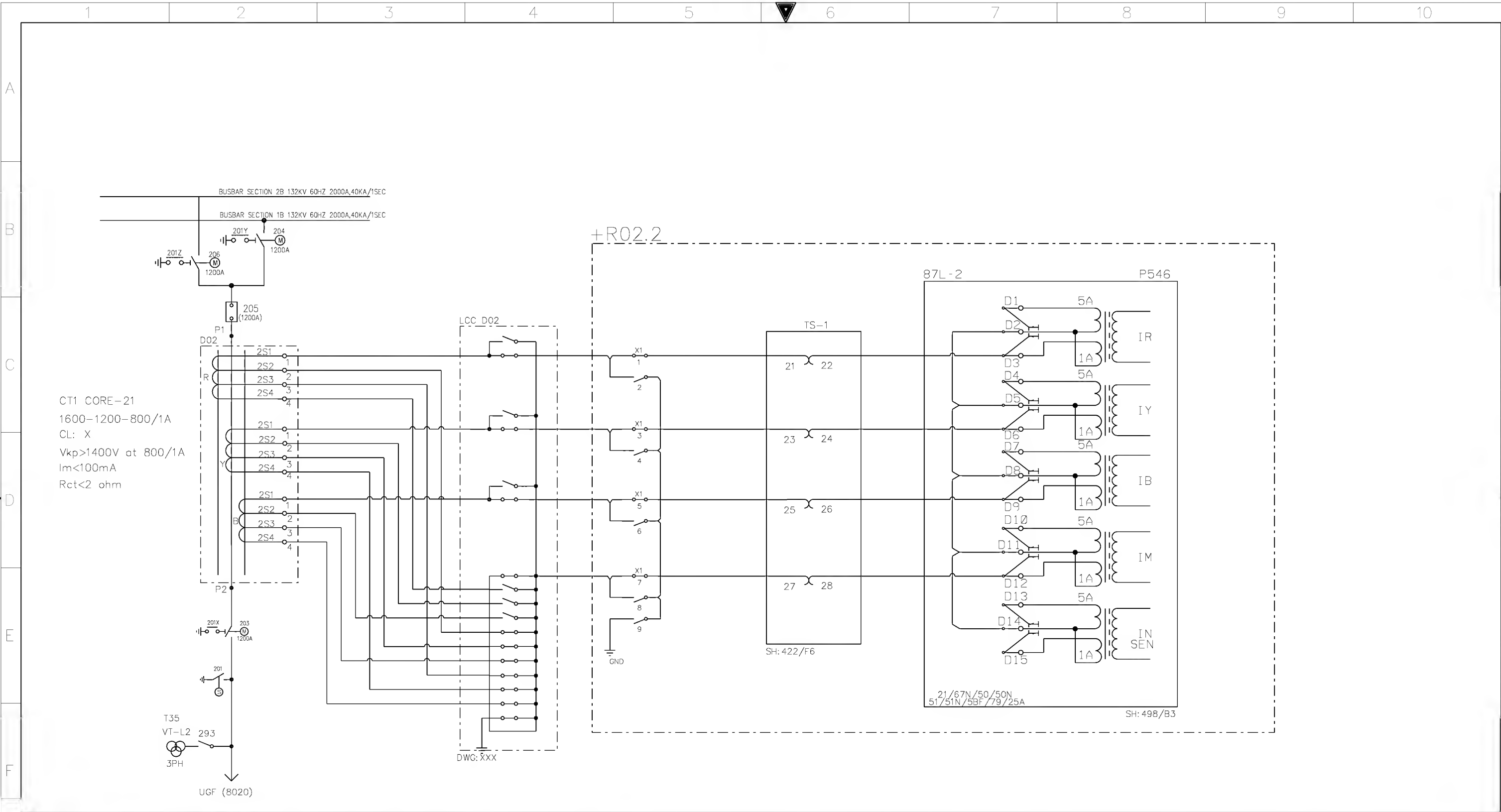
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| 01 | 13 49 | FACTORY ASBUILT |
| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

| | | | |
|--------------|------------|----------------|----------|
| DRAWN BY | RIZ | CHECKED BY | KVR |
| DATE STARTED | 24.01.2013 | DATE COMPLETED | |
| OPRG. DEPT. | CTPD | ENG. DEPT. | AUT-PSAC |

AC MCB AUX CONTACTS
132kV UGF-8020 RELAY PANEL-2 +R02.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
National Grid sa

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+R02.2

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01

13 49

FACTORY ASBUILT

00

13 04

FOR APPROVAL

REV. NO.

DATE

DESCRIPTION

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC


CURRENT TRANSFORMER INPUTS -87L-2

132kV UGF-8020 RELAY PANEL-2 +R02.2

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



National Grid sa

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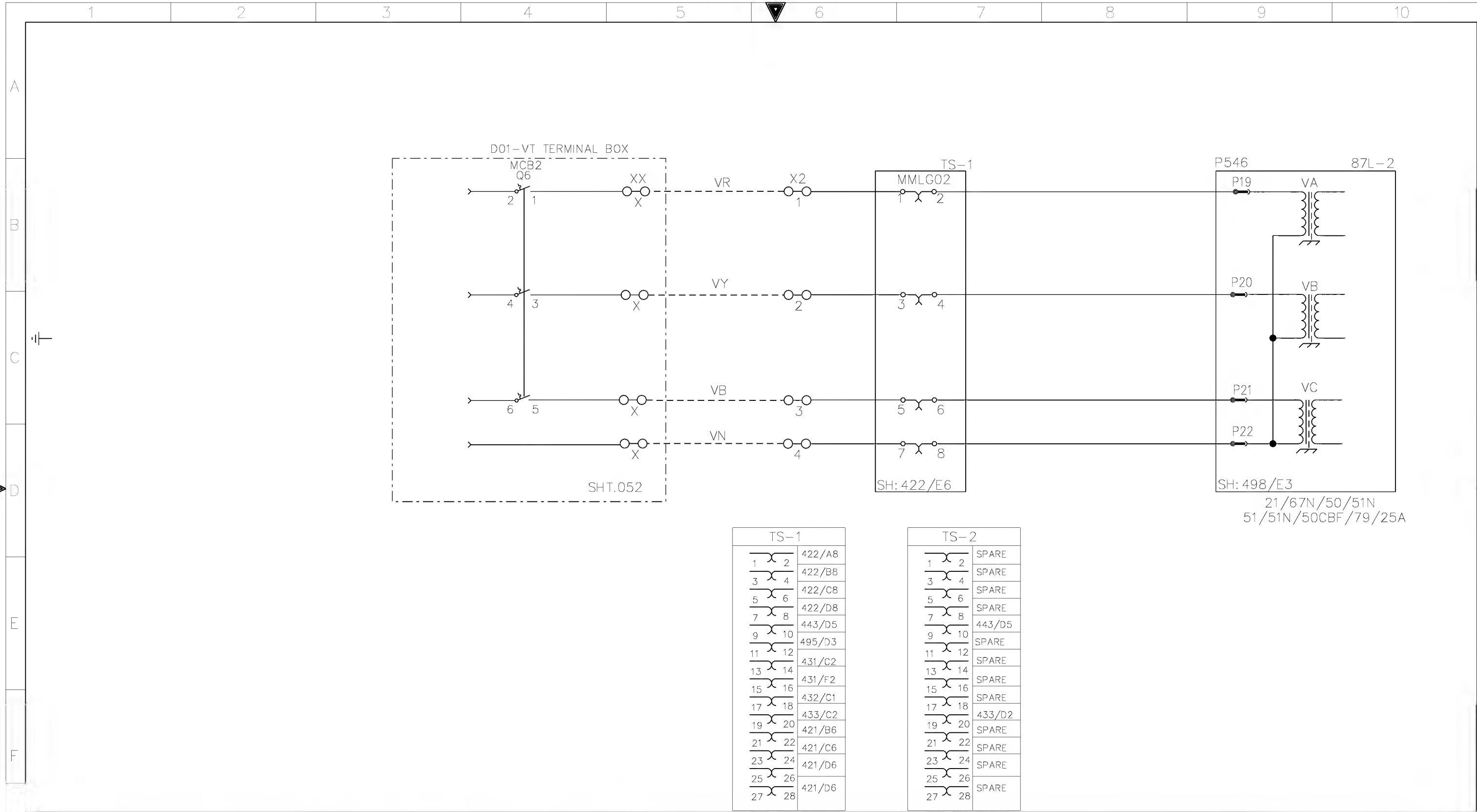
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CD-322916

421

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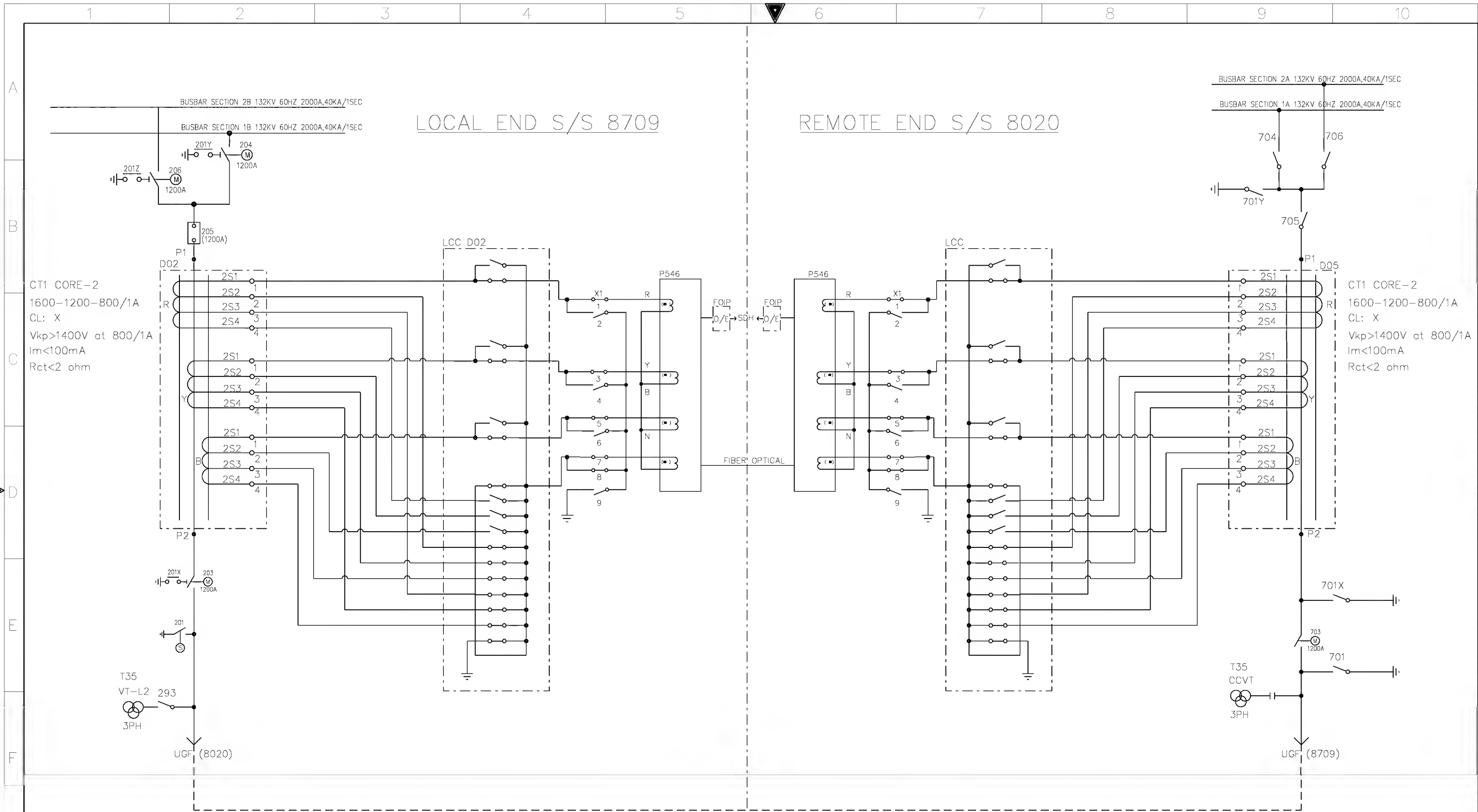


AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | | | |
|----------|-------|-----------------|-------------------------|---------------------|
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

VOLTAGE TRANSFORMER INPUTS -87L-2
132kV UGF-8020 RELAY PANEL-2 +R02.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

| | | | | | |
|------------------------------|-----------|----------------|-----------|------------------|----|
| الشركة الوطنية لنقل الكهرباء | | نقل الكهرباء | | National Grid sa | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. | |
| - | C421 | CD-322916 | 422 | 423 | 01 |



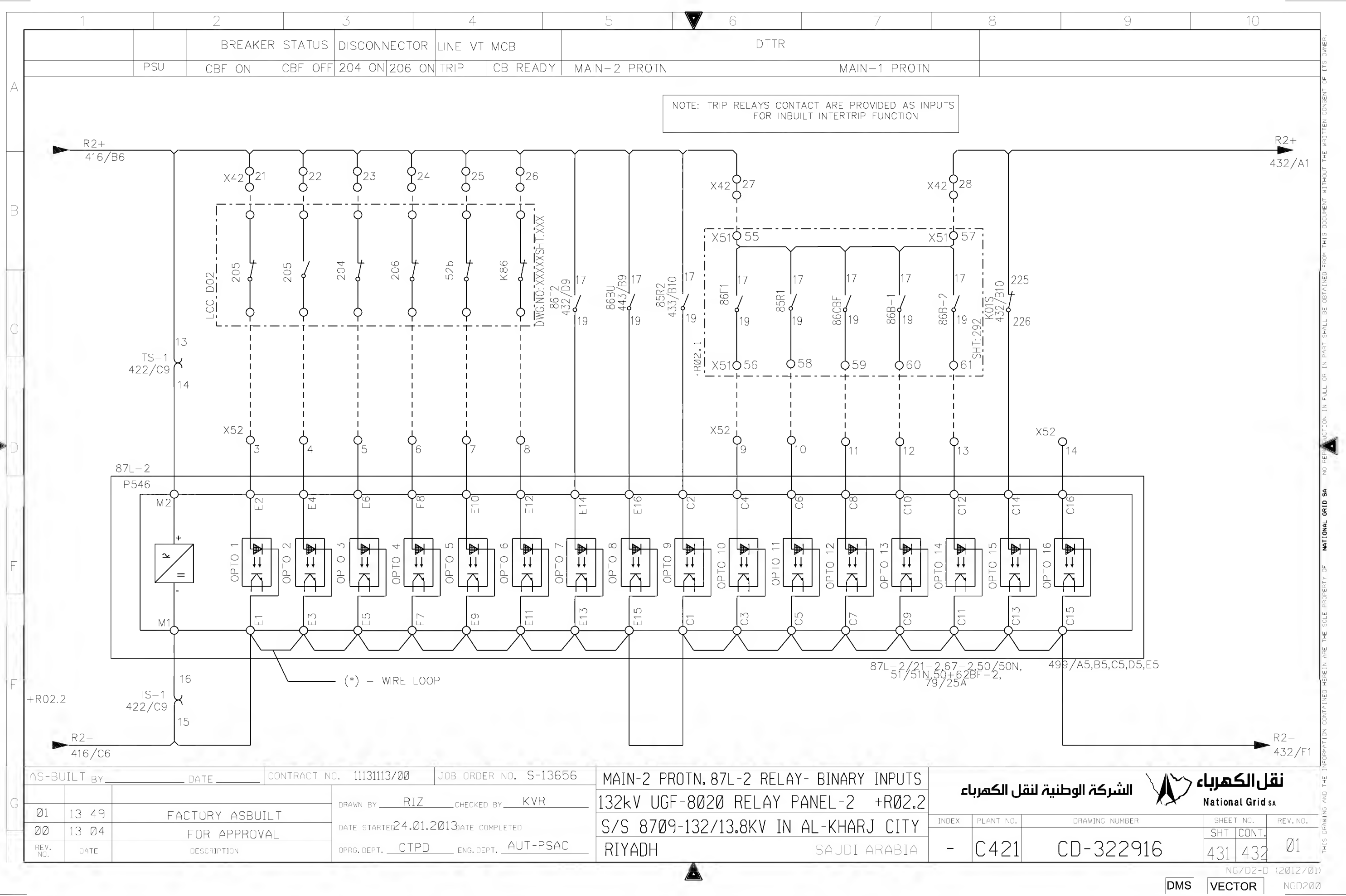
+R02.2

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

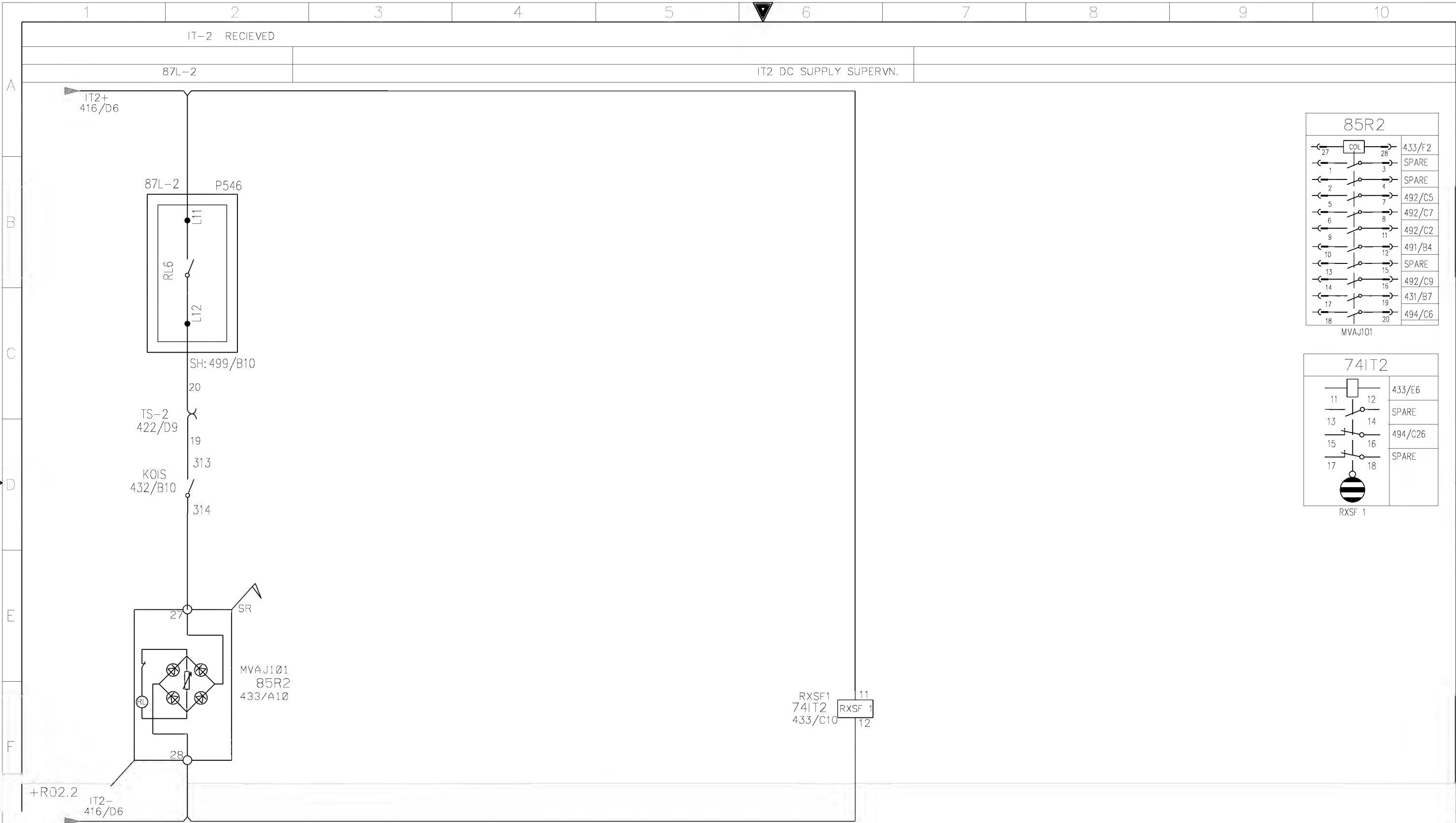
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| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED _____ |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

COMMUNICATION CIRCUITS
132kV UGF-8020 RELAY PANEL-2 +R02.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

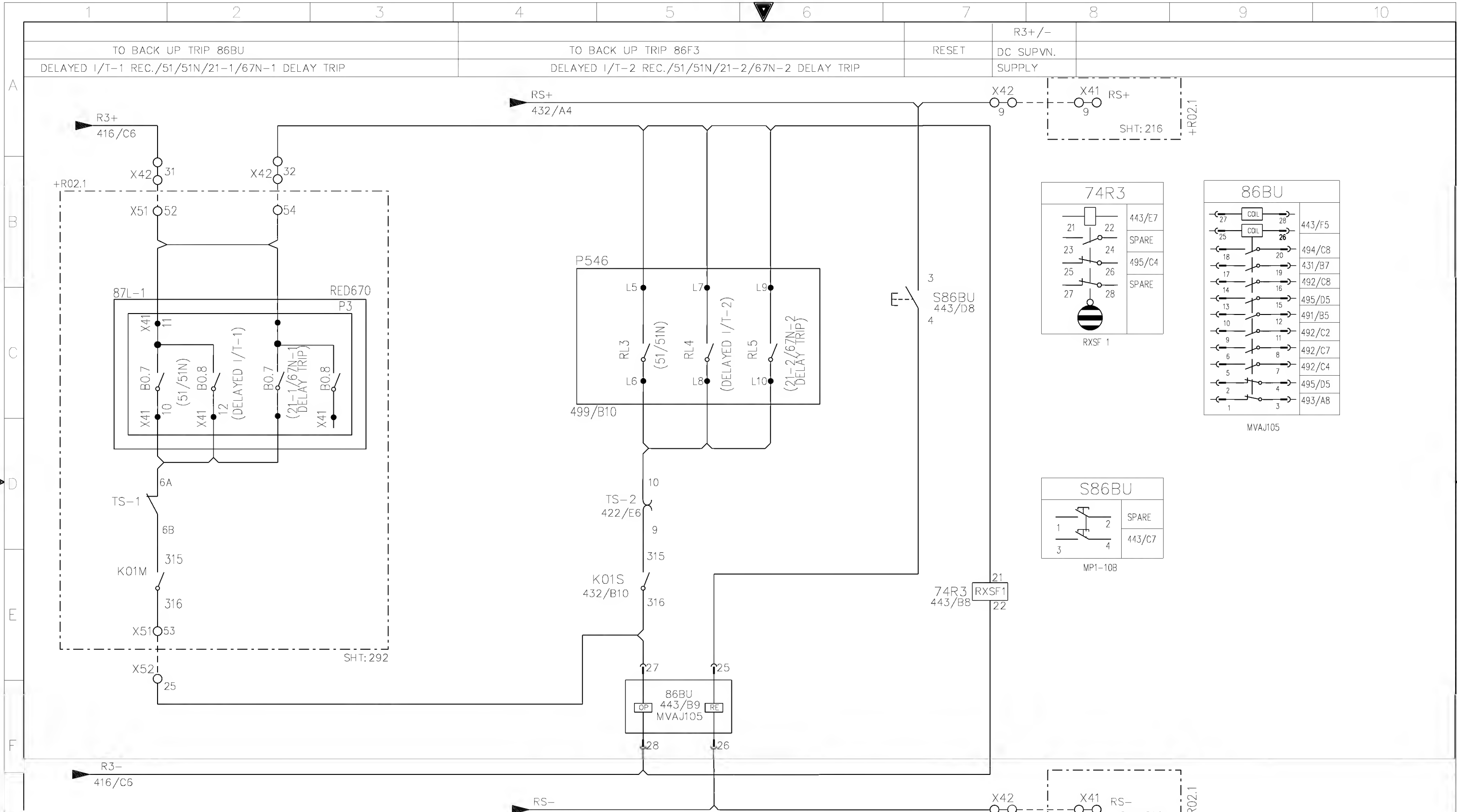
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|----|--|-----------|----------------|------------|--------------|----------|
| | | C421 | CD-322916 | SHT 423 | CONT. 431 | 01 |



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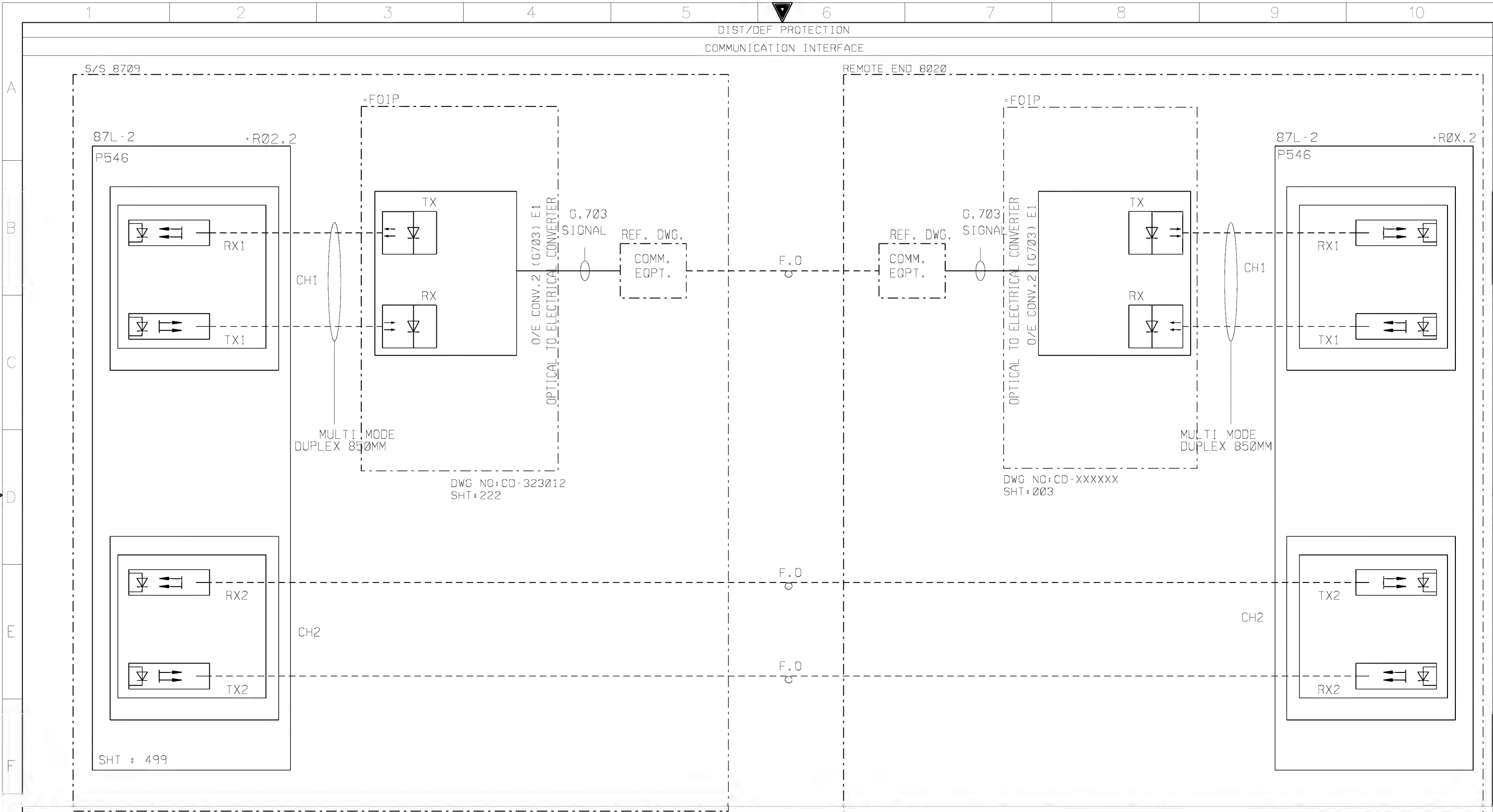
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|---|------------------------------|-------|--------------------------|--|--|--|--|-------|---|----------------|--|-----------|-----------|----------|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | MAIN-2 DISTANCE.PROTECTION TRIP RELAY CKT. | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div> | | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-2 +R02.2 | | | | | | | |
| | 00 | 13 04 | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | | | |
| | REV. NO. | DATE | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | | | | | | |
| | | | | | | | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| | | | | | | | | - | C421 | CD-322916 | | SHT 433 | CONT. 443 | 01 |



| | | | | | | |
|------------------------------|-------|---------------------------------|--------------------------|--|-----------------------|--|
| AS-BUILT BY _____ DATE _____ | | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | |
| 01 | 13 49 | FACTORY ASBUILT FOR APPROVAL | DRAWN BY RIZ | | CHECKED BY KVR | |
| 00 | 13 04 | | DATE STARTED 24.01.2013 | | DATE COMPLETED _____ | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | | ENG. DEPT. AUT-PSAC | |

BACKUP PROTECTION TRIP RELAY CIRCUIT
132kV UGF-8020 RELAY PANEL-2 +R02.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

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|------------------------------|-----------|---|-----------|------------------|----------|
| الشركة الوطنية لنقل الكهرباء | |  | | نقل الكهرباء | |
| | | | | National Grid SA | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | | REV. NO. |
| | | | SHT | CONT. | |
| - | C421 | CD-322916 | 443 | 446 | 01 |



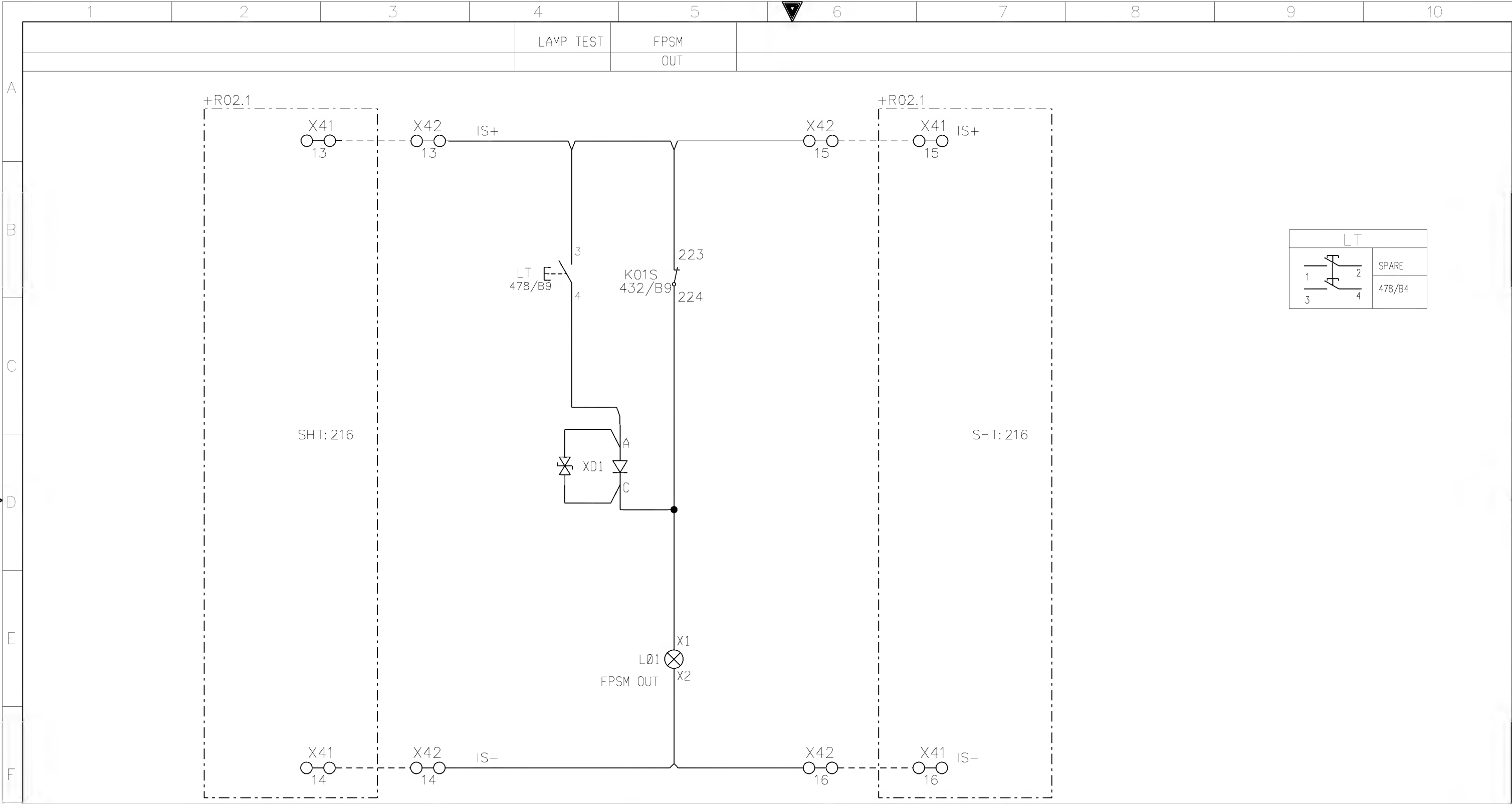
AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | |
|----------|-------|-----------------|
| 01 | 13 49 | FACTORY ASBUILT |
| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

| | | | |
|--------------|------------|----------------|----------|
| DRAWN BY | RIZ | CHECKED BY | KVR |
| DATE STARTED | 24.01.2013 | DATE COMPLETED | |
| OPRG. DEPT. | CTPD | ENG. DEPT. | AUT-PSAC |

| | |
|--------------------------------------|--|
| COMMUNICATION INTERFACE | |
| 132kV UGF-8020 RELAY PANEL-2 +R02.2 | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | |
| RIYADH SAUDI ARABIA | |

| | | | | |
|--|-----------|----------------|-----------|-------|
| الشركة الوطنية لنقل الكهرباء National Grid sa | | | | |
| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | |
| - | C421 | CD-322916 | SHT | CONT. |
| | | | 446 | 478 |
| | | | REV. NO. | |
| | | | 01 | |

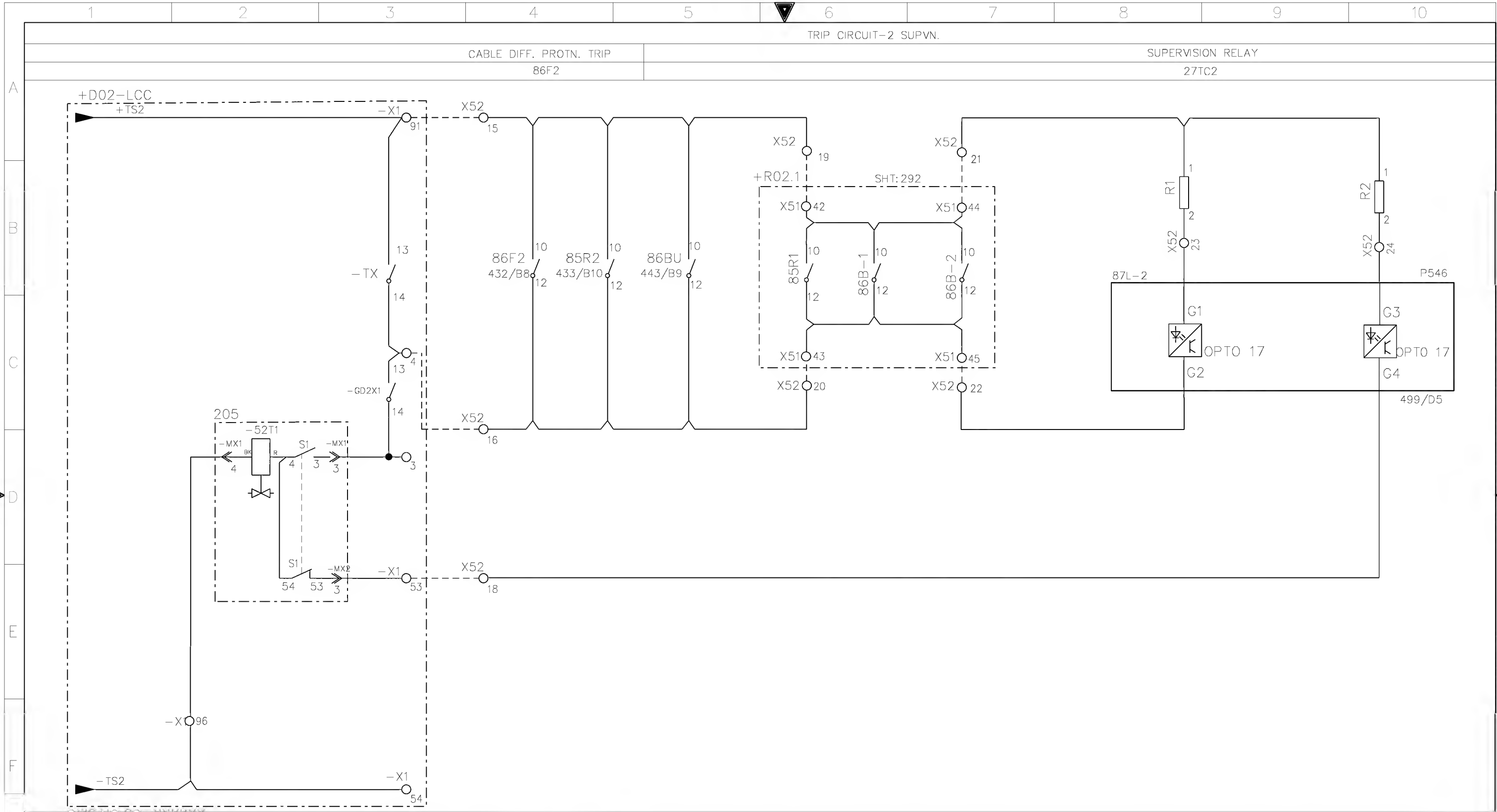


AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | | | |
|----------|-------|-----------------|-------------------------|---------------------|
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

MAIN-2 INDICATION CIRCUIT
132kV UGF-8020 RELAY PANEL-2 +R02.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

| | | | | | |
|------------------------------|-----------|---|--|------------------|-------|
| الشركة الوطنية لنقل الكهرباء | |  | | نقل الكهرباء | |
| | | | | National Grid sa | |
| INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | |
| | C421 | CD-322916 | | SHT | CONT. |
| | | | | 478 | 491 |
| | | | | REV. NO. | |
| | | | | 01 | |



DWG. NO. CD=XXXXXX
SHT. XX

+R02.2

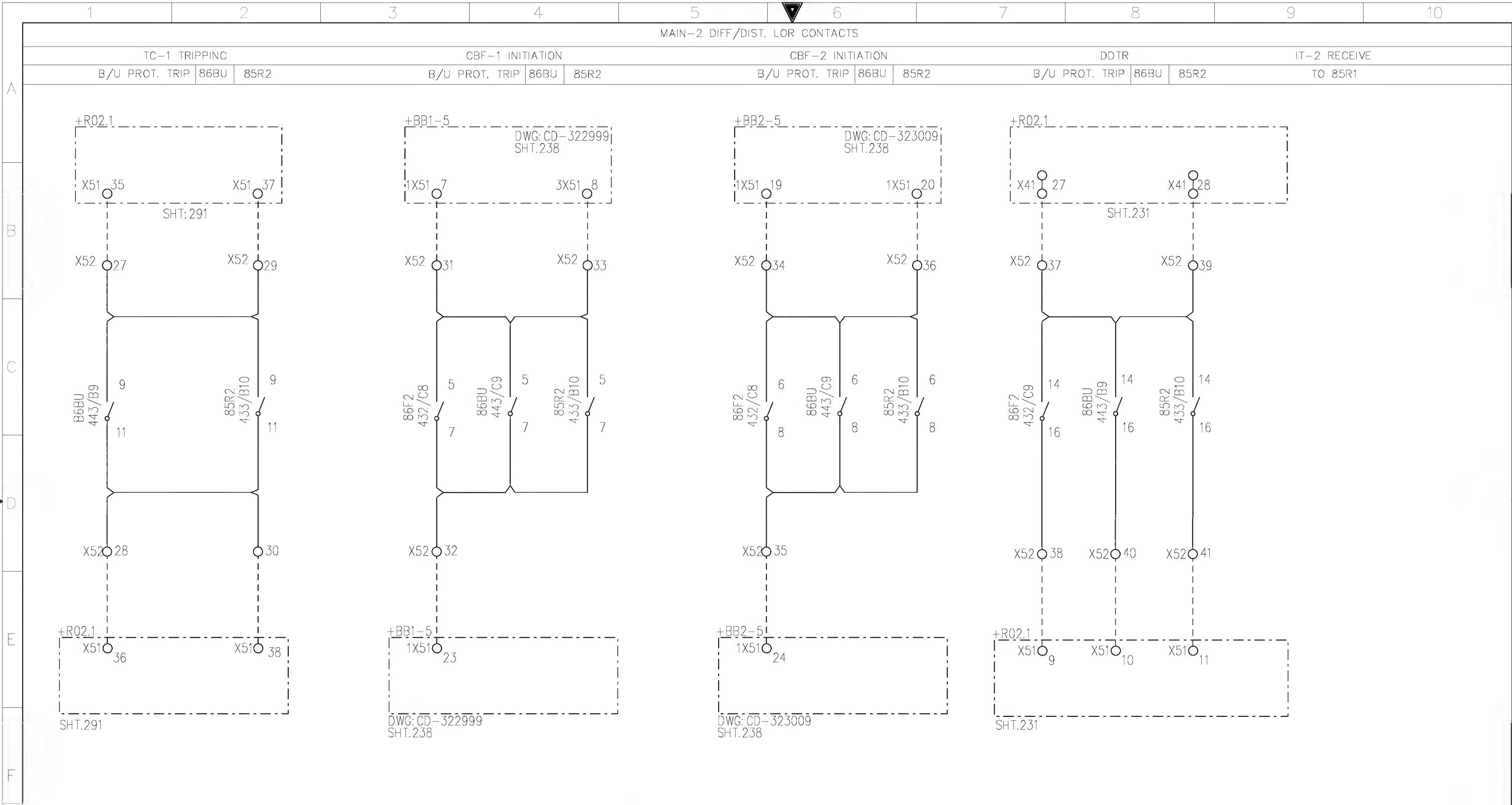
AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | | | |
|----------|-------|-----------------|-------------------------|---------------------|
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

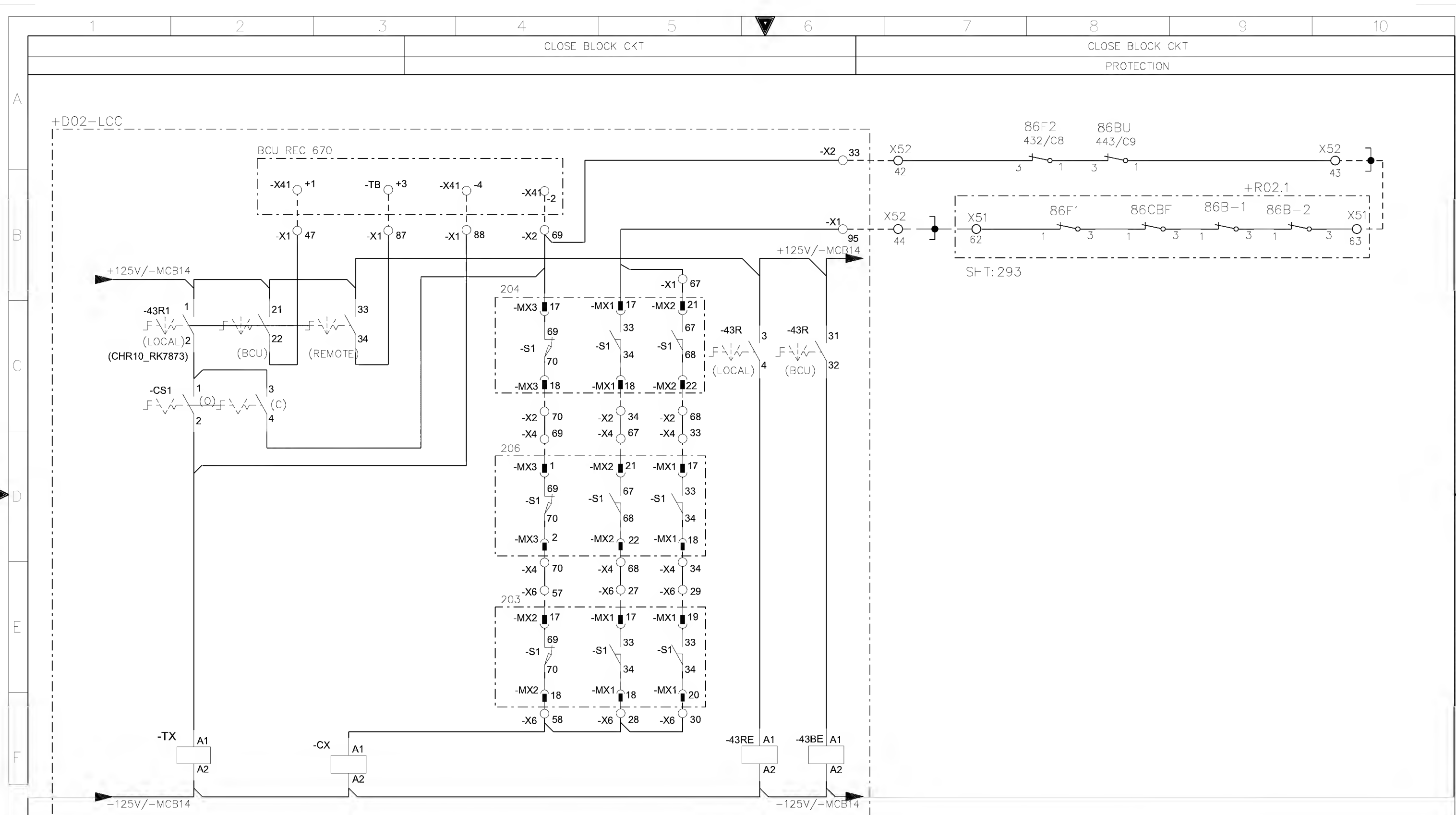
TRIP COIL-2 SUPERVSION CIRCUIT
132kV UGF-8020 RELAY PANEL-2 +R02.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
National Grid sa

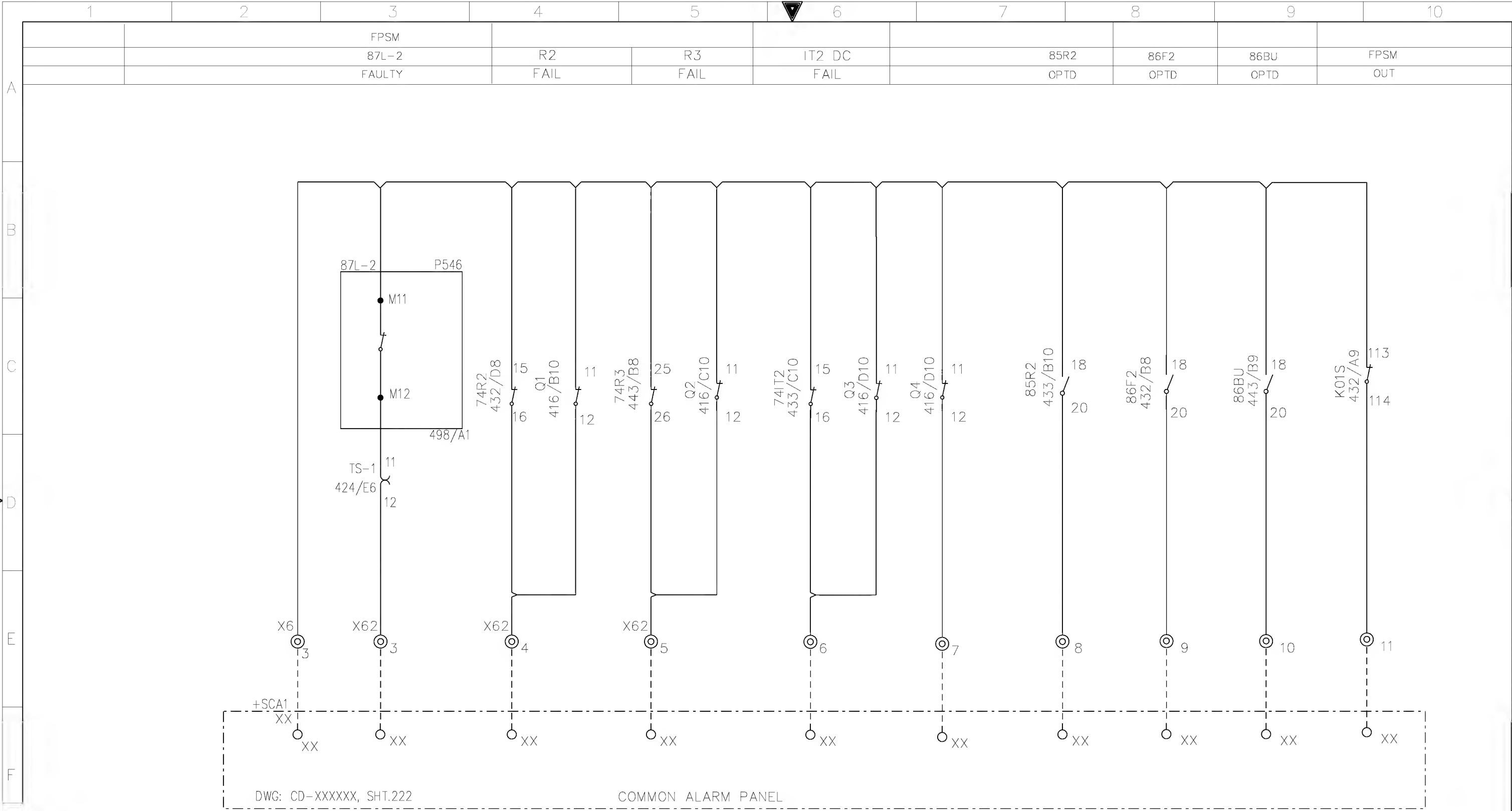
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|-------|-----------|----------------|-----------|-----------|
| - | C421 | CD-322916 | SHT 491 | CONT. 492 |
| | | | | 01 |



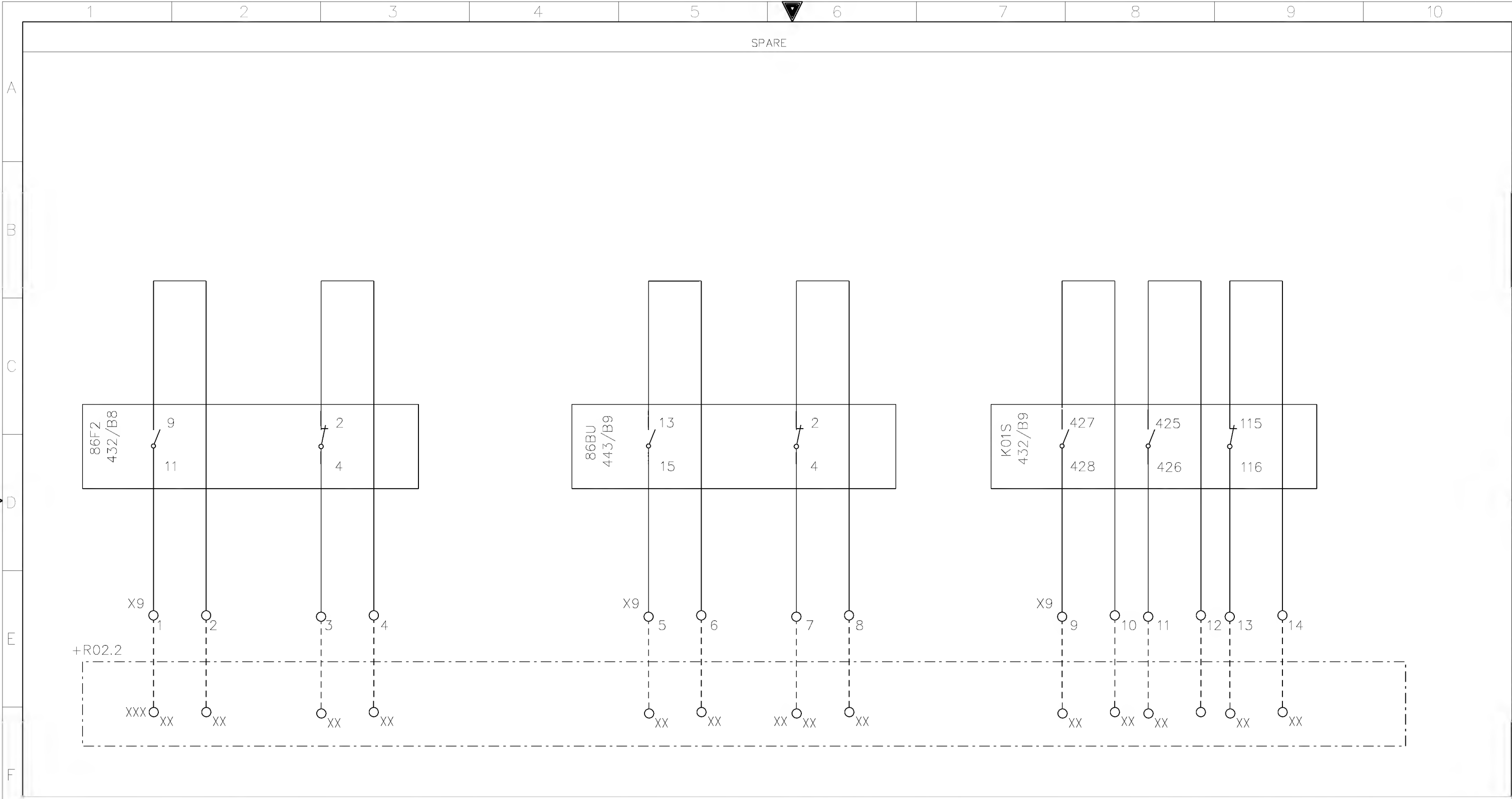
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|---|------------------------------|--|--------------------------|--|--|--|---------------------------------------|--|-----------------------------|---|--|--|--|--|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | TRIP COIL-1 & CBF INITIATION CONTACTS | | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div> | | | | |
| | 01 13 49 | | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-2 +R02.2 | | | | | | | |
| | 00 13 04 | | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | | | |
| | REV. NO. DATE | | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | | INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO. | | | | |
| | | | | | | | | | - C421 CD-322916 492 493 01 | | | | | |



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|--------------------------------------|--|--|--|--|--|--|--|--|--|--------------------------------------|--|--|--|--|--|--|--|--|--|
| +R02.2 | | | | | | | | | | DRG.NO.ED-XXXXXX | | | | | | | | | |
| SHT: XX | | | | | | | | | | | | | | | | | | | |
| AS-BUILT BY _____ DATE _____ | | | | | | | | | | CONTRACT NO. 11131113/00 | | | | | | | | | |
| | | | | | | | | | | JOB ORDER NO. S-13656 | | | | | | | | | |
| | | | | | | | | | | CLOSING CIRCUIT | | | | | | | | | |
| 01 13 49 | | | | | | | | | | FACTORY ASBUILT | | | | | | | | | |
| 00 13 04 | | | | | | | | | | FOR APPROVAL | | | | | | | | | |
| REV. NO. | | | | | | | | | | DATE | | | | | | | | | |
| DESCRIPTION | | | | | | | | | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | | | | | | | | |
| DRAWN BY RIZ | | | | | | | | | | CHECKED BY KVR | | | | | | | | | |
| DATE STARTED 24.01.2013 | | | | | | | | | | DATE COMPLETED | | | | | | | | | |
| 132kV UGF-8020 RELAY PANEL-2 +R02.2 | | | | | | | | | | | | | | | | | | | |
| S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | | | | | | | | | | | | | | | |
| RIYADH | | | | | | | | | | SAUDI ARABIA | | | | | | | | | |
| INDEX | | | | | | | | | | PLANT NO. | | | | | | | | | |
| DRAWING NUMBER | | | | | | | | | | SHEET NO. | | | | | | | | | |
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| - C421 | | | | | | | | | | CD-322916 | | | | | | | | | |
| 493 | | | | | | | | | | 494 | | | | | | | | | |
| 01 | | | | | | | | | | | | | | | | | | | |



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|---|------------------------------|-------|--------------------------|--|--|--|--------------------------------------|-------|---|----------------|--|-----------|-----------|----------|
| G | AS-BUILT BY _____ DATE _____ | | CONTRACT NO. 11131113/00 | | JOB ORDER NO. S-13656 | | COMMON ALARM CIRCITS | | <div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div> | | | | | |
| | 01 | 13 49 | FACTORY ASBUILT | | DRAWN BY RIZ CHECKED BY KVR | | 132kV UGF-8020 RELAY PANEL-2 +R02.2 | | | | | | | |
| | 00 | 13 04 | FOR APPROVAL | | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | | | | | |
| | REV. NO. | DATE | DESCRIPTION | | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | RIYADH SAUDI ARABIA | | | | | | | |
| | | | | | | | | INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
| | | | | | | | | - | C421 | CD-322916 | | SHT 494 | CONT. 495 | 01 |



| | | | | | | | | | | | |
|----------|-------|-----------------|---|--|--|--------------------------------------|--|--|---|--|--|
| +R02.2 | | | AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656 | | | SPARE CONTACTS | | | الشركة الوطنية لنقل الكهرباء | | |
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ CHECKED BY KVR | | | 132kV UGF-8020 RELAY PANEL-2 +R02.2 | | | National Grid sa | | |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 DATE COMPLETED _____ | | | S/S 8709-132/13.8KV IN AL-KHARJ CITY | | | INDEX PLANT NO. DRAWING NUMBER SHEET NO. CONT. REV. NO. | | |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC | | | RIYADH SAUDI ARABIA | | | - C421 CD-322916 495 498 01 | | |

A

B

C

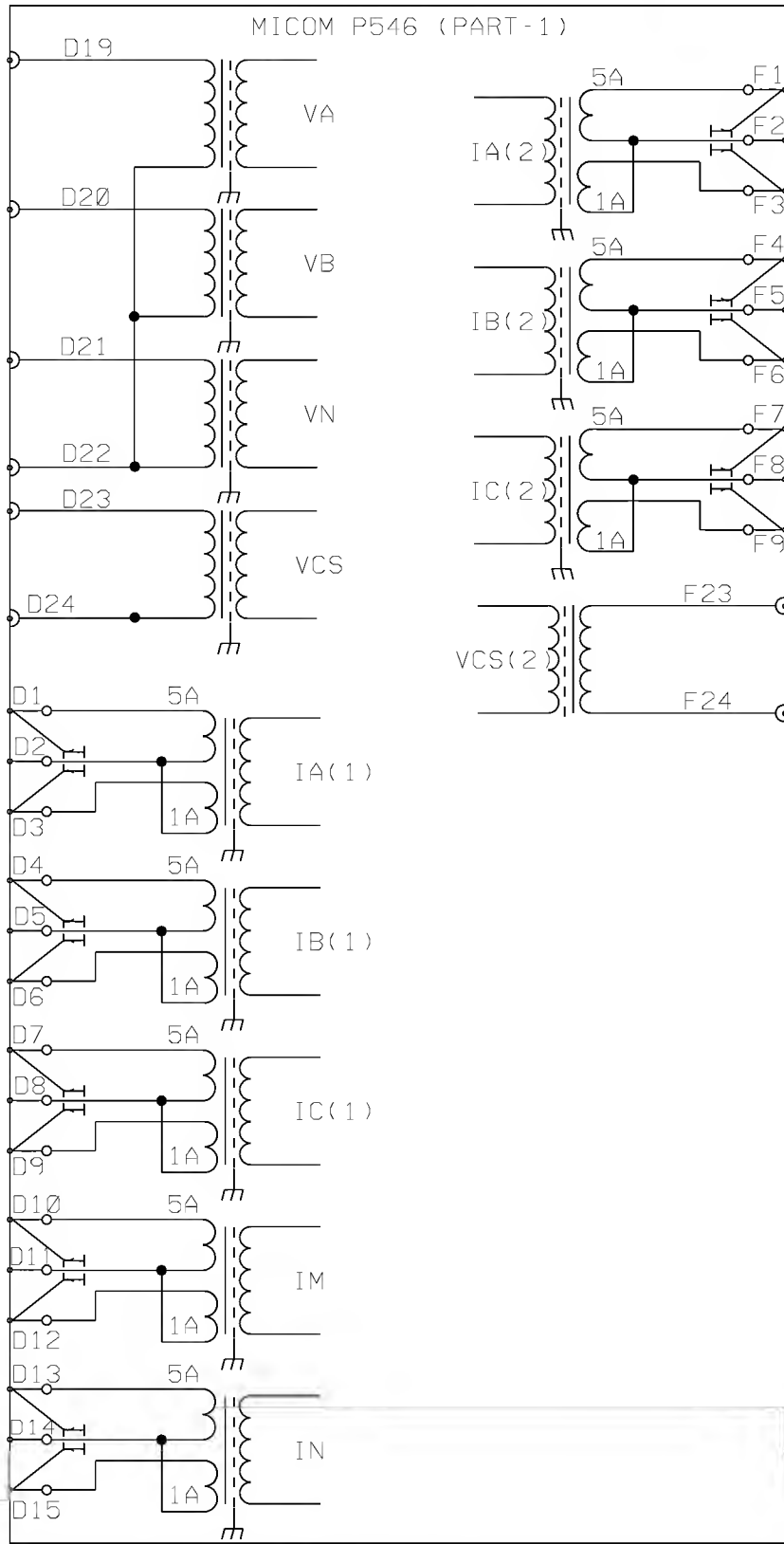
D

E

F

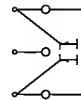
422/B9,C9

421/B8,C8,D8



NOTES:

(A)



C.T SHORTING LINKS

(B)



PIN TERMINAL (P.C.B TYPE)

2. USED FOR SELF PROTECTION, I SENSITIVE SHOULD BE DRIVEN FROM A CORE BALANCE CT WHEN SENSITIVE SETTINGS ARE USED
3. M I INPUT IS FOR OPTIONAL MUTUAL COMPENSATION

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

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|----------|-------|-----------------|
| 01 | 13 49 | FACTORY ASBUILT |
| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

BLOCK REFERENCE

132kV UGF-8020 RELAY PANEL-2 +R02.2

S/S 8709-132/13.8KV IN AL-KHARJ CITY

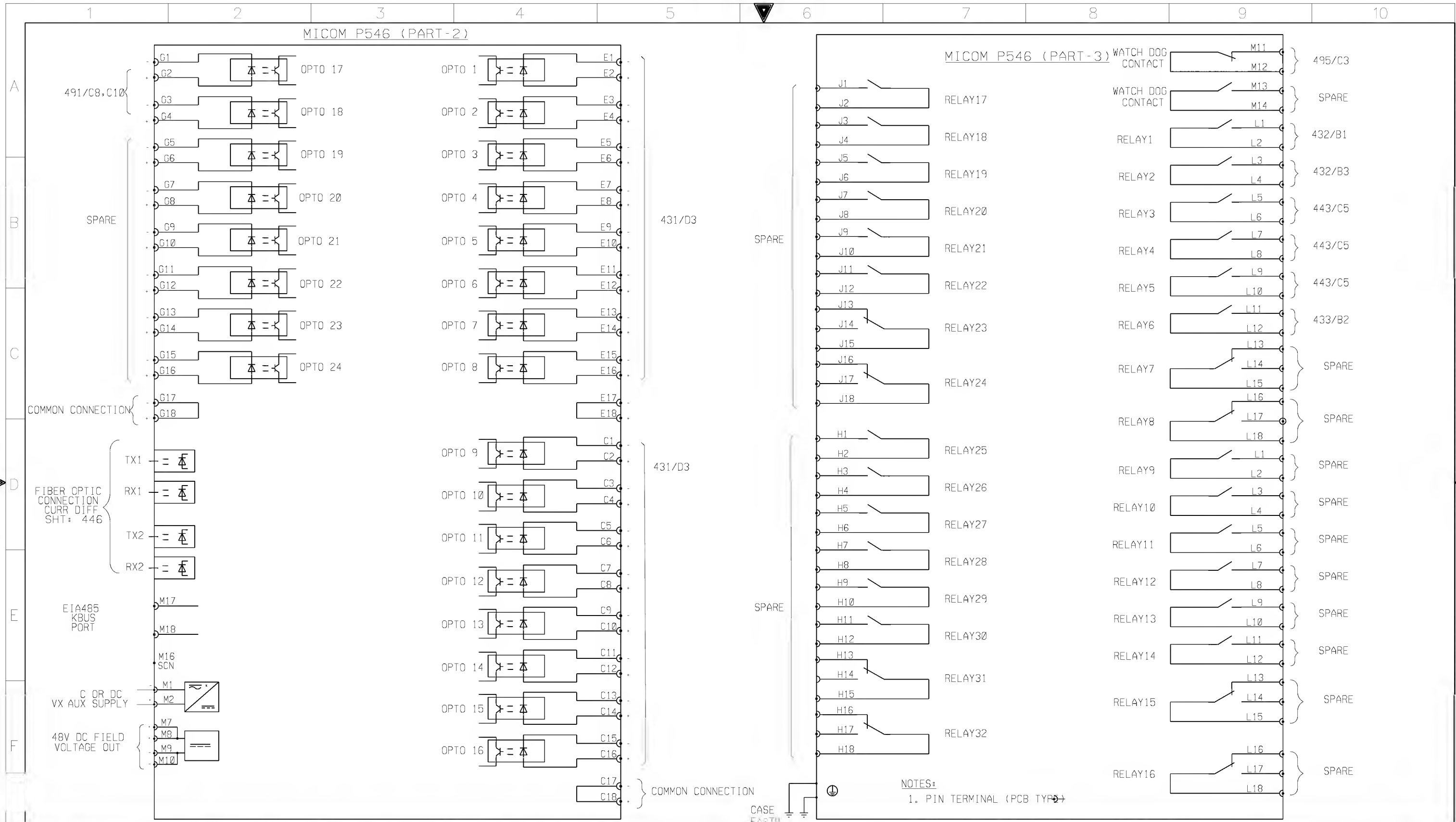
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء

National Grid sa

| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
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| - | C421 | CD-322916 | SHT CONT. | 01 |
| | | | 498499 | |



AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

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|----------|-------|-----------------|-------------------------|---------------------|
| 01 | 13 49 | FACTORY ASBUILT | DRAWN BY RIZ | CHECKED BY KVR |
| 00 | 13 04 | FOR APPROVAL | DATE STARTED 24.01.2013 | DATE COMPLETED |
| REV. NO. | DATE | DESCRIPTION | OPRG. DEPT. CTPD | ENG. DEPT. AUT-PSAC |

CLOSING CIRCUIT

132kV UGF-8020 RELAY PANEL-2 +R02.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
National Grid sa

| INDEX | PLANT NO. | DRAWING NUMBER | SHEET NO. | REV. NO. |
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| - | C421 | CD-322916 | SHT 499 | CONT. 501 |
| | | | | 01 |

NG/D2-D (2012/01)

DMS VECTOR NGD200

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| A | | | | | | | | | | |
| B | | | | | | | | | | |
| C | | | | | | | | | | |
| D | | | | | | | | | | |
| E | | | | | | | | | | |
| F | | | | | | | | | | |

| REFERENCE | X1 CT CKT. |
|-----------|---------------|
| 421/C5 | 1 |
| 421/C5 | 2 |
| 421/C5 | 3 |
| 421/C5 | 4 |
| 421/D5 | 5 |
| 421/D5 | 6 |
| 421/D5 | 7 |
| 421/D5 | 8 |
| 421/E5 | 9 |
| SPARE | 10 |

| REFERENCE | XTJ T.JACK |
|-----------|---------------|
| 411/C3 | 1 |
| 411/C3 | 2 |
| 411/D3 | 3 |
| 411/D3 | 4 |
| SPARE | 5 |

| REFERENCE | XSH SPACE HEATER |
|-----------|---------------------|
| 411/E6 | 1 |
| 411/F6 | 2 |
| SPARE | 3 |

| REFERENCE | X6 ALM. CKT. |
|-----------|-----------------|
| 412/C5 | 1 |
| 412/C5 | 2 |
| 495/E2 | 3 |

| REFERENCE | X2 VT CKT. |
|-----------|---------------|
| 422/B6 | 1 |
| 422/B6 | 2 |
| 422/C6 | 3 |
| 422/C6 | 4 |
| SPARE | 5 |

| REFERENCE | X3 AC CKT. |
|-----------|---------------|
| 411/A3 | 1 |
| 411/B3 | 2 |
| 411/A3 | 3 |
| 411/C3 | 4 |
| 411/B3 | 5 |
| 411/C3 | 6 |
| 411/B3 | 7 |
| 411/C3 | 8 |
| SPARE | 9 |
| SPARE | 10 |

| REFERENCE | X62 ALM. CKT. |
|-----------|------------------|
| 412/E5 | 1 |
| 412/E5 | 2 |
| 494/E3 | 3 |
| 494/E4 | 4 |
| 494/E5 | 5 |
| 494/E6 | 6 |
| 494/E7 | 7 |
| 494/E8 | 8 |
| SPARE | 9 |
| SPARE | 10 |
| SPARE | 11 |
| SPARE | 12 |
| SPARE | 13 |
| SPARE | 14 |
| SPARE | 15 |

| REFERENCE | X42 DC CKTS. |
|-----------|-----------------|
| 416/B3 | 1 |
| 416/B3 | 2 |
| 416/B3 | 3 |
| 416/C3 | 4 |
| 416/C3 | 5 |
| 416/C3 | 6 |
| 432/A2 | 7 |
| 432/F2 | 8 |
| 443/A4 | 9 |
| 443/F4 | 10 |
| SPARE | 11 |
| SPARE | 12 |
| 478/B3 | 13 |
| 478/E3 | 14 |
| 478/B8 | 15 |
| 478/E8 | 16 |
| 416/E3 | 17 |
| 416/E3 | 18 |
| SPARE | 19 |
| SPARE | 20 |
| 431/B3 | 21 |
| 431/B4 | 22 |
| 431/B4 | 23 |
| 431/B5 | 24 |
| 431/B5 | 25 |
| 431/B6 | 26 |
| 431/B8 | 27 |
| 431/B9 | 28 |
| SPARE | 29 |
| SPARE | 30 |
| 443/A2 | 31 |

| REFERENCE | X52 CONTROL & PROTIN CKTS. |
|-----------|-------------------------------|
| 416/F7 | 1 |
| 416/F7 | 2 |
| 431/D4 | 3 |
| 431/D4 | 4 |
| 431/D5 | 5 |
| 431/D6 | 6 |
| 431/D6 | 7 |
| 431/D7 | 8 |
| 431/D8 | 9 |
| 431/D8 | 10 |
| 432/C4 | 11 |
| 432/C4 | 12 |
| 443/F2 | 13 |
| SPARE | 14 |
| 491/A4 | 15 |
| 491/C4 | 16 |
| 491/E4 | 17 |
| 491/A6 | 18 |
| 491/C6 | 19 |
| 491/A7 | 20 |
| 491/C7 | 21 |
| 491/A8 | 22 |
| 491/B8 | 23 |
| 491/A10 | 24 |
| 443/B10 | 25 |
| SPARE | 26 |
| 492/B2 | 27 |
| 492/D2 | 28 |
| 492/B3 | 29 |
| 492/D3 | 30 |
| 492/B4 | 31 |
| 492/D4 | 32 |
| 492/B5 | 33 |
| 492/B6 | 34 |
| 492/D6 | 35 |
| 492/B7 | 36 |
| 492/B8 | 37 |
| 492/D8 | 38 |
| 492/B9 | 39 |
| 492/D9 | 40 |
| 492/A7 | 41 |
| 492/A10 | 42 |
| 492/B7 | 43 |
| SPARE | 44 |
| SPARE | 45 |
| SPARE | 46 |
| SPARE | 47 |
| SPARE | 48 |
| SPARE | 49 |
| SPARE | 50 |

| REFERENCE | X9 SPARE |
|-----------|-------------|
| 495/E1 | 1 |
| 495/E2 | 2 |
| 495/E3 | 3 |
| 495/E3 | 4 |
| 495/E5 | 5 |
| 495/E5 | 6 |
| 495/E6 | 7 |
| 495/E6 | 8 |
| 495/E7 | 9 |
| 495/E8 | 10 |
| 495/E8 | 11 |
| 495/E8 | 12 |
| 495/E9 | 13 |
| 495/E9 | 14 |
| SPARE | 15 |
| SPARE | 16 |
| SPARE | 17 |
| SPARE | 18 |
| SPARE | 19 |
| SPARE | 20 |
| SPARE | 21 |
| SPARE | 22 |
| SPARE | 23 |
| SPARE | 24 |
| SPARE | 25 |

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

| | | |
|----------|-------|-----------------|
| 01 | 13 49 | FACTORY ASBUILT |
| 00 | 13 04 | FOR APPROVAL |
| REV. NO. | DATE | DESCRIPTION |

DRAWN BY RIZ CHECKED BY KVR
DATE STARTED 24.01.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

TERMINAL BLOCKS PANEL +R01.2
132kV UGF-8020 RELAY PANEL-2 +R02.2
S/S 8709-132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

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| الشركة الوطنية لنقل الكهرباء | |  | | نقل الكهرباء | | |
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| INDEX | PLANT NO. | DRAWING NUMBER | | SHEET NO. | | REV. NO. |
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